RCA Victor

SERVICE NOTES

for

1931 — 1932

Broadcast Radio Receivers

Short-Wave Radio Receivers

Phonograph Combination Instruments

Miscellaneous Service Information

Service Division

RCA Victor Company, Inc.

Camden, N. J., U.S.A.

Property
Wm. J. Held.

RCA Victor

SERVICE NOTES

for

1931 — 1932

Broadcast Radio Receivers

Short-Wave Radio Receivers

Phonograph Combination Instruments

Miscellaneous Service Information

Service Division

RCA Victor Company, Inc.

Camden, N. J., U. S. A.

INTRODUCTION

The Instruction Books and Service Notes contained herein are for the radio receiver and phonograph combination models sold by the RCA Victor Co., Inc., during the years 1931–1932. This information has been compiled for RCA Victor Distributors and Dealers for use by their personnel in conjunction with the servicing and replacing of parts in the instruments listed.

Proper operation of any radio receiver is dependent upon correct service methods and replacement of defective parts. We earnestly recommend that you follow the instructions given, use the equipment recommended and replace defective parts with genuine RCA Victor Factory Tested Replacement Parts. Your Distributor will be glad to obtain any part or service equipment mentioned in this book and give you any possible assistance in the performance of your work.

CONTENTS

The Booklets and Data Sheets Listed are Contained in this Volume in the Order Listed

RCA World-Wide Antenna System

RCA Victor Shield Kits

Frequency, Impedance, Inductance and Capacity Chart

RCA Full-Range Test Oscillator

RCA Tools and Accessories

Radiotron Data Sheets

SR-1, SR-2, and SR-3 (Two-Speed Turntables)

MB-1, MB-2, and MB-3 (Replacement Motor Boards)

2-19

2-25

2-65

SWA-2

R-4 and R-6

R-5

R-5X

R-5 D.C.

T-5

R-7 (Superette)

R-7A

R-7 L.W.

R-7 D.C. and R-9 D.C.

SK-7

R-8 and R-12

R-8 D.C. (220-volt)

R-10

R-10 D.C.

R-11

R-11 Supplement

RE-16

RE-16A

RE-18

RE-18A

RE-19

RE-20

R-21

RO-23

RAE-26

CE-29

M-30

P-31

M-32

PT-33

R-43

R-50 and R-55

RAE-59

RAE-68

R-70

RE-73

R-74, R-76, and R-77

RAE-79

Automatic Record Changing Mechanism

Special Service Information

FACTORY-TESTED RCA PARTS

LET THEM HELP YOU BUILD A PROFITABLE SERVICE BUSINESS

*"As a Quality Business, Radio Service Will Become a Profitable Business"**

THE most valuable asset any radio service business can have is the confidence of its customers. As in any professional service business, there are three factors in radio service work which go to create customer confidence: the ability of the radio service engineer, the business methods employed, and the parts or merchandise used.

The most tangible of these three factors is the parts used. Months must elapse after a service job is done before your customer can be sure of your ability; repeated contacts are necessary before your customer is aware of your business methods; but today he can appreciate the fact that you used the highest quality, factory-tested parts when you serviced his radio receiver.

And that mere fact alone—that you used factory-tested parts of a well-known brand—reassures him that you are competent and that your business methods are of the same high quality as the parts you used. Because you have used quality parts, your customer is confident he is getting a quality job and is satisfied to pay a quality price.

What makes for quality in radio parts?

First, consider the manufacturers: their reputation, their position in the radio industry, their research and laboratory facilities, their manufacturing facilities, their reputation for quality and fair dealing. Consider all of these points when you buy replacement parts and you have your best reason for insisting on factory-tested RCA Parts.

Through every step from the research in the laboratory to the packaging, RCA Parts are designed to be worthy of the greatest name in radio, RCA. Every radio replacement part manufactured by RCA Victor Company, Inc., owes its quality primarily to RCA's unmatched laboratory and engineering facilities, and secondly to a factory organization that for thirty years has produced only quality merchandise.

Let us take an RCA power transformer, for instance. It was designed to do a specific job by engineers who are specialists in power transformers, who have concentrated their efforts for years on this one type of equipment. They have had the invaluable advantage of the collaboration of other specialists in all divisions of radio engineering.

Every normal requirement of the power transformer's particular function is first calculated. Tentative specifications providing generous safety margins are drawn up. From these specifications sample lots are

The oscillograph gives Paul Whiteman a "picture" of his music

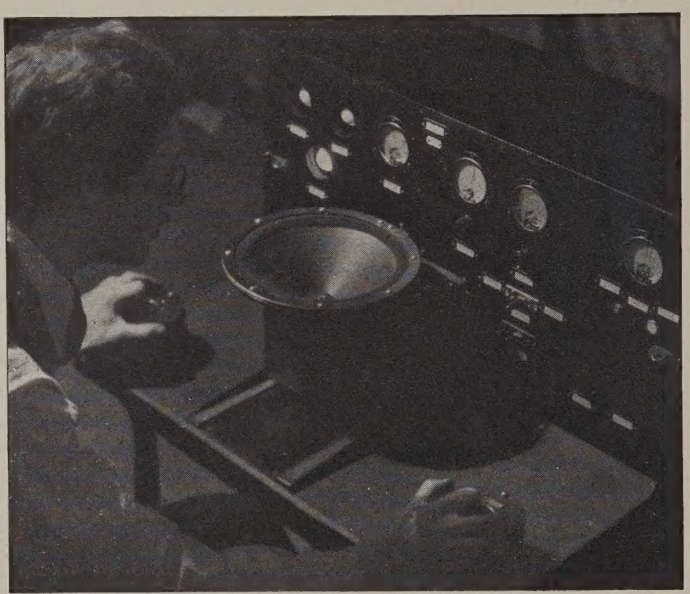
* Excerpt from an editorial, RCA Radio Service News, April 20, 1934, by E. M. Hartley, Manager, RCA Parts Division.

Drawing I. F. curves by means of specially developed equipment

manufactured and the product is tested in actual use. Changes in specifications may be necessary before the Engineering Department permits the transformer to go into regular production. However, when design specifications are adopted for a part, and a stock number assigned to it, thereafter every part sold under that number must conform to specifications as to essential electrical characteristics. RCA Replacement Parts do not vary from one factory lot to another. You are assured of uniformity between lots as well as between individual pieces.

In the Manufacturing Department, the quality of RCA Parts starts with the specifications and rigid tests for raw materials, and continues through the manufacturing processes. In power transformers, for example, the multiple winding system is used to avoid strain and to permit of tests of individual coils before assembling. An exclusive vacuum asphalt process of impregnation gives complete penetration of laminations as well as of coils. The result is a product that is impervious to moisture and which has an extremely low hum or rattle factor. RCA power transformers, as all RCA Parts, are built up to laboratory standards of quality rather than down to meet a price and yet they cost no more than "just-as-good" parts.

"Factory-tested" is more than a slogan. It means that every RCA Part is tested individually many times between steps in production. It means that every RCA Part is tested as a finished product. It means that sample lots of parts are tested before shipment. Most of all, it means that the transformer you buy, or any part you buy, is not just another transformer, but is factory-tested for the particular job it was designed for. It means that you get quality in the fullest sense of the word.



Each speaker gets a high voltage breakdown and impedance test

But why buy quality factory-tested RCA Parts from an authorized RCA Parts distributor when apparently the same part or an almost-as-good part can be obtained from, for instance, a salvage house? The reason is —salvage. Who can afford to entrust his reputation and good will to replacement parts that were salvaged out of old sets or

The continuity test—one of many tests along the production line

The first step toward quality—testing raw materials

Where test instruments are tested—the Standards Laboratory

Test data is carefully noted and studied

that were rejected by the factory as not up to quality standards? Who can afford to make the call-backs necessitated by the failure of salvaged or "just-as-good" parts?

Parts for radio receivers can be made cheaply as so many turns of wire and so many pieces of iron, or they can be built with the precision of laboratory apparatus. When parts are scientifically designed to perform a certain function, built with precision to the most exact standards from only the finest raw materials, and then tested time and time again during the process of manufacture, they naturally cost more to produce than parts whose outstanding feature is their price.

Similarly, merchandise that is produced to meet a demand, and sold only through legitimate channels of distribution, must cost more than merchandise that has been dumped on the market or salvaged from what sources nobody knows. If such merchandise has any place in the radio-service industry it is in that part that does poor work, with poor parts, and can charge only starvation prices.

For a profitable radio-service business, conducted by real radio-service sales engineers, the best quality parts are the soundest investment that can be made. They save time and money, and, in the long run, they save the customer's good will. Their cost is only a small part of profitable radio-service prices.

RCA Parts, purchased from an authorized RCA Parts distributor, are the only RCA Parts which you can be sure were factory-tested. They are guaranteed by the manufacturer and by the distributor—and the distributor stands ready at all times to make good the factory guarantee.

RCA Parts give your service work the prestige of the greatest name in radio. They give you the assurance that the customer will accept them without question.

RCA Parts are quality parts, for quality work, entitling you to charge quality prices. They are worth the difference.

Use factory-tested RCA Parts—and let your customers know that you use them.

FOR PROFITABLE SERVICE WORK

FACTORY-TESTED RCA PARTS

Announcing . . .

The RCA World-Wide Antenna System

A Di-Pole Antenna System for All-Wave Receivers

Stock No. 9500

The RCA World-Wide Antenna System is an expertly designed di-pole antenna system for all-wave receivers. Greatly improved signals and elimination of noise pickup between the antenna and receiver are among its numerous features.

ADVANTAGES

1. The RCA World-Wide Antenna System uses a "Double Doublet" antenna (a doublet is a special short-wave antenna), which gives as much as five times the signal pickup as that of an ordinary antenna.

2. The RCA World-Wide Antenna System uses a special transmission line between the antenna and the receiver which permits the antenna to be placed as far as 500 feet from the receiver without loss in efficiency. This transmission line also eliminates noise pickup between the antenna and the receiver.

3. The RCA World-Wide Antenna System uses a coupling transformer, located at the receiver, to properly match the transmission line to the input circuit of the receiver. A low-capacity switch is mounted on the transformer for switching from broadcast to short-wave reception so that maximum efficiency is obtained on both bands.

4. The RCA World-Wide Antenna System gives greatly improved results on the broadcast band.

5. The RCA World-Wide Antenna System greatly improves the reception of all short-wave receivers. On the older type short-wave receivers using adaptors, the results are especially desirable.

6. The RCA World-Wide Antenna System is easy to install. Stranded antenna wire is furnished in exact lengths, tinned at proper points for soldering. The transmission line is light and flexible and does not require heavy transposition blocks or cut-and-try methods for installing. A special cross-over insulator and all necessary insulators and fittings are included in the kit.

7. The RCA World-Wide Antenna System may be used in locations where physical limitations prohibit the erection of full-length antenna spans. Loading coils (obtainable as an accessory) may be used to increase the antenna lengths, electrically.

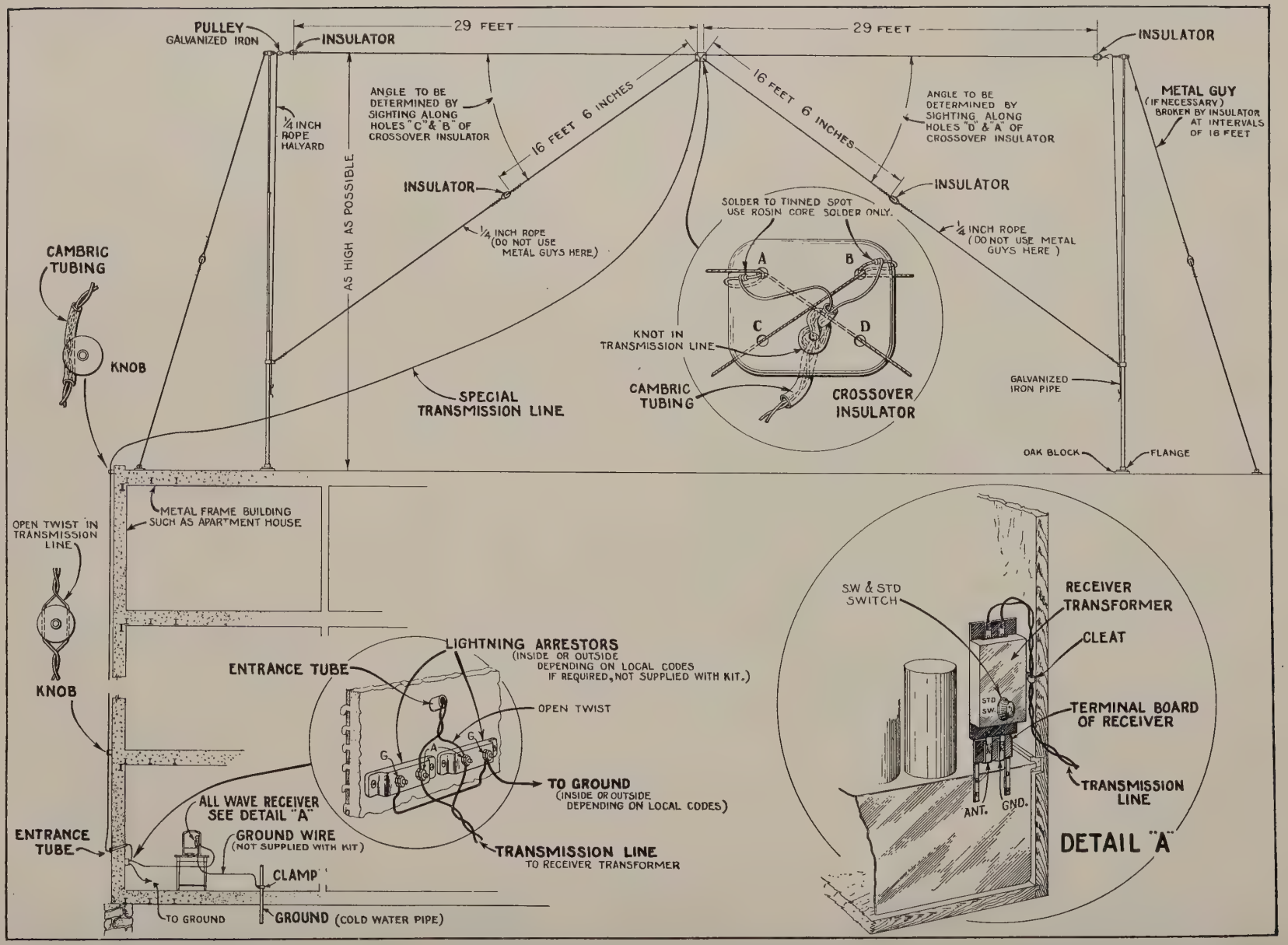
8. The RCA World-Wide Antenna System consists of a kit of parts, packed in an attractive carton and made up of the following items:

1 Antenna Transformer and Switch
1 Antenna Crossover Insulator
2 Rolls Antenna Wire—each roll 46½ ft. long
1 Roll Transmission Line—110 ft. long
4 Strain Insulators
1 Lead-in Insulator
2 Transmission Line Insulators
1 Ground Clamp
1 Transmission Line Clamp
3 Wood Screws
2 Insulating Sleeves
2 Spacers

List Price $6.00

Order from

ALL RCA PARTS DISTRIBUTORS



Typical Installation of Stock No. 9500 Kit

MANUFACTURED BY

RCA Victor Company, Inc.

CAMDEN, N. J., U. S. A.

RCA VICTOR SHIELD KITS

Stock Nos. 7717 and 7718

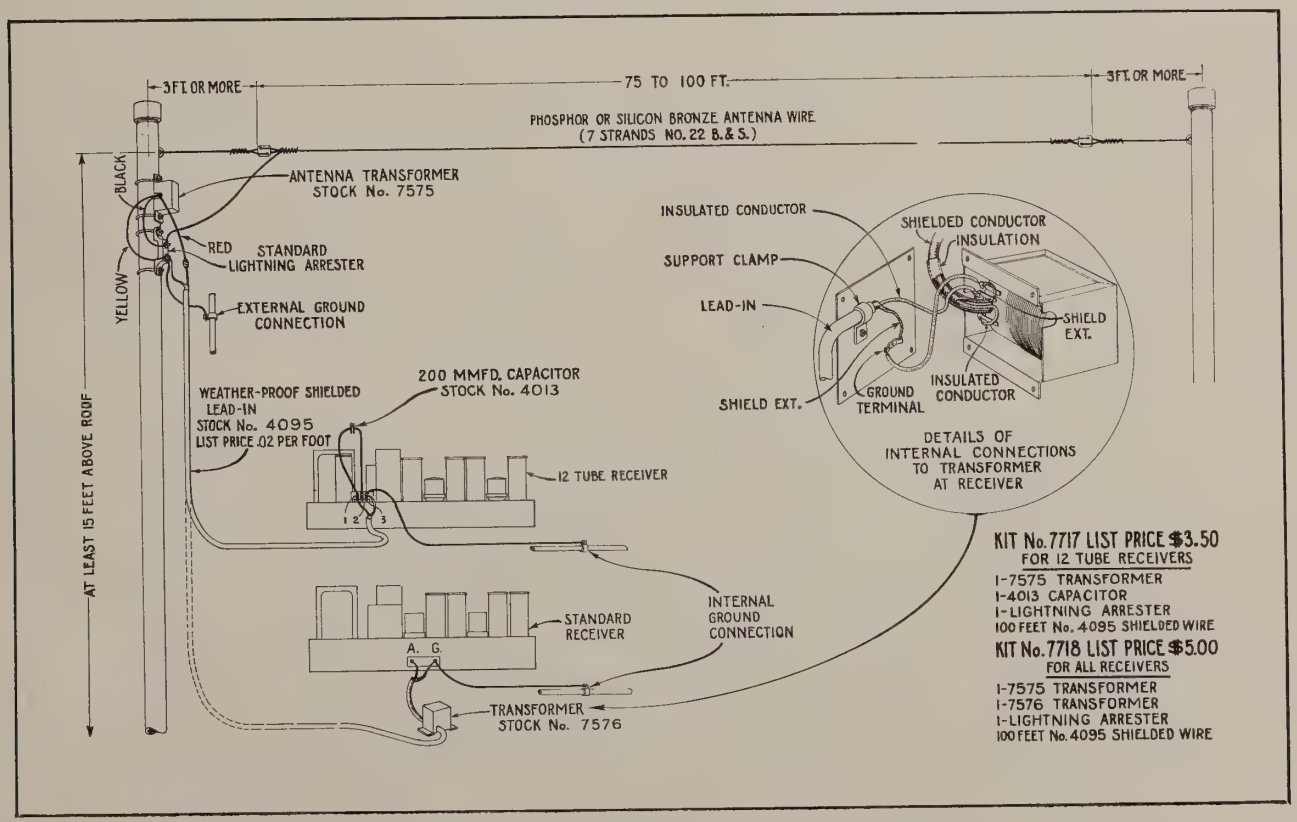
The RCA Victor Shield Kits, Stock Nos. 7717 and 7718, consist of an assembly of parts designed to be used in conjunction with radio receivers for the prevention of interference pickup by the lead-in portion of an antenna system. Inasmuch as the majority of man-made interference is picked up on the lead-in section of an antenna, installation of these kits greatly improves the ratio of signal to noise.

The Stock No. 7717 kit consists of an antenna transformer, 100 feet of low-impedance shielded lead-in wire, a 200 mmfd. capacitor and a lightning arrester. This kit is designed to be used with the RCA Victor Model 280 *only* and does not include a receiver coupling transformer. Such omission is made possible by the inclusion of a tap on the antenna coil of the Model 280, which matches the impedance of the shielded lead-in.

The Stock No. 7718 kit consists of an antenna transformer, 100 feet of shielded lead-in wire, a receiver transformer and a lightning arrestor. This kit is designed to be used with all types of broadcast receivers. The illustration below shows the proper manner of connecting these kits.

In conjunction with the Stock Nos. 7717 and 7718 kits, it must be remembered that these lead-in systems will not affect such conditions as natural atmospheric conditions which induce static into the antenna or any other noise that is picked up by the flat top portion of the antenna. To visualize the gain in these systems, the results will be approximately equal to the reception that would be obtained if the receiver were located at the top of the antenna pole.

These kits will give excellent results over the entire broadcast and police frequency bands. However, they are not recommended for the short-wave broadcasting bands.

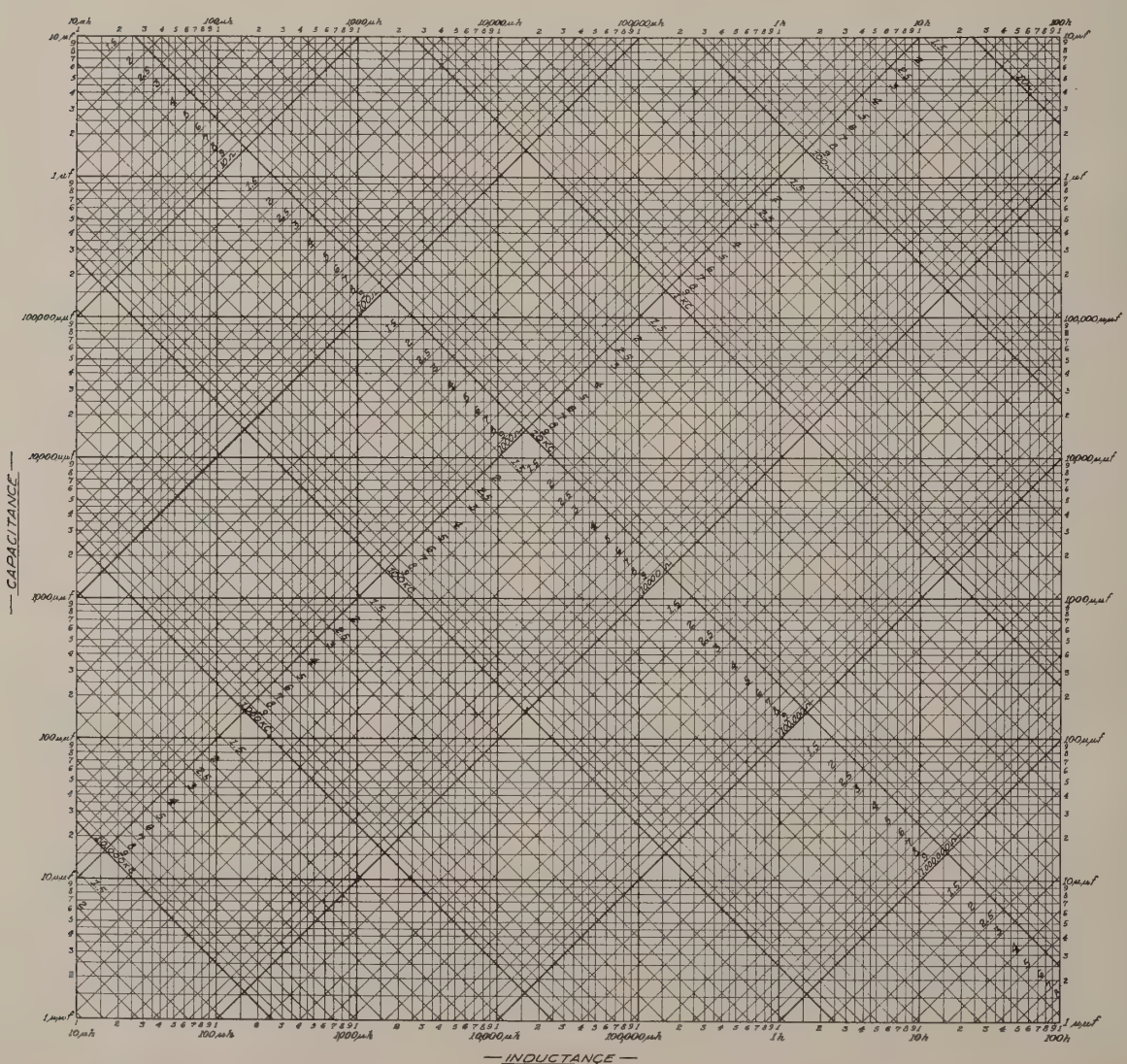


0796

Proper Method of Connecting Kits to Antenna and Receivers

Chart of Frequency or Impedance vs. Inductance and Capacity

The Chart shown below provides a quick method of determining several unknown factors when one or more are known. The Chart covers a very wide range, namely, from 10 micro-henries to 100 henries inductance, 10 cycles to 50,000 kilocycles, 1 ohm to 10 megohms and 1 micro-microfarad to 10 microfarads. If, for example, one wishes to know the capacitance to use with a 10 henry inductor to have it resonate at 50 cycles, it can be readily seen that it would be a 1 mfd. capacitor. This is determined by finding the intersection of the vertical line representing 10 henries and the oblique line representing 50 cycles. The intersection occurs at the horizontal line representing 1 mfd. The other oblique line at this intersection represents the impedance at this frequency. This is approximately 3000 ohms.



RCA

Full Range Test Oscillator

Type TMV-97-B

Front View

Rear View of Chassis

The RCA Full Range Type TMV-97-B Test Oscillator is a modulated R. F. oscillator which supersedes the Type TMV-97-A. New features are a wider frequency range, an improved calibrated tuning dial (reading in frequency) and a direct-reading range switch. All older features such as small compact size, light weight, self-contained batteries, etc., of the Type TMV-97-A are retained.

The frequency range extends continuously from 90 K. C. to 25,000 K. C. (3300–12 meters) and is divided into eight bands. This covers all intermediate, broadcast, police and short-wave frequency line-up points of all makes of receivers. An eight-position range switch provides for the selection of any desired band. An attenuator (output control) gives a means of adjusting the output to any level. This is very important in modern receivers, due to the increasing practice of combining the automatic volume control with other tubes.

Of special interest to amateurs and experimenters is the simplicity with which the modulation may be eliminated. This may be done by the use of a special adapter in the modulator socket. The oscillator then may be used as a heterodyne oscillator for short-wave superheterodyne receivers or for heterodyning the I. F. frequency of all-wave receivers to permit reception of pure CW signals.

Proper servicing of the simplest receivers is impossible without an oscillator. New designs covering an increasingly higher frequency range make the use of such an oscillator imperative. The TMV-97-B Oscillator fills the need for such apparatus at a price heretofore considered impossible

SPECIFICATIONS

Circuit—A tuned-grid, plate-modulated circuit is used, which gives good stability over a wide range of voltage and climatic conditions. The output is modulated 50% at 400 cycles.

Radiotrons—Two Radiotrons RCA-30 are used, one as an R. F. oscillator and one as an A. F. modulator.

Batteries Required—One 22½ volt "B" battery and one 4½ volt "C" battery are used. The "C" battery provides filament power for the Radiotrons, the filaments of which are connected in series.

Size—Height 8½ inches (including raised handle), case alone 6½ inches, width 9¾ inches, depth 4½ inches.

Weight—3½ lbs., including batteries.

Switch—A toggle-type operating switch for turning the oscillator "on" and "off" is mounted on the front panel.

Frequency Range—90 K. C.–25,000 K. C. by eight bands. The Range Switch is located on the front panel and marked directly in frequency.

Output—Two binding posts on the front panel, together with an attenuator, give an easy means of connecting and adjusting the output.

Dial—Variable vernier dial adjustable from 6:1 to 20:1 speed reduction. The dial glass has been made thicker so that the indicator line is very close to the dial, thus avoiding a possible parallax.

Calibration—The dial is calibrated directly in frequency to an accuracy of ±3%. Complete individual calibration may be obtained at an additional cost of $5.00.

Case—The entire oscillator is enclosed in a black wrinkle-finished aluminum case provided with a leather handle.

Net Price $29.50

(WITH RADIOTRONS—LESS BATTERIES)

Order Stock No. 9050

RCA Tools and Accessories

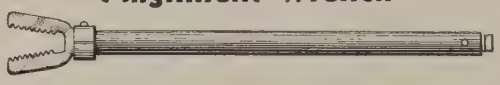
The following tools and accessories are useful for servicing Radio Receivers, Combinations and Short-Wave Instruments of all types and manufacture.

Alignment Tool

Stock No. 4160 **Net Price $0.60**

The Stock No. 4160 Alignment Tool is a bakelite shaft combination screwdriver and socket wrench. The metal screwdriver bit is so shaped that the increase in capacity caused by its touching a trimmer screw is offset by the reduction in inductance caused by its shape. This is very important when making adjustments on all-wave receivers where the screwdriver must be inserted through the end of the coil. The socket end fits the main tuning capacitor trimmer adjustment screws used on numerous RCA Victor Receivers. The bakelite shaft is 7/32" diameter, which gives entrance to 1/4" holes, used on older model Radiola receivers.

Alignment Wrench



Stock No. 7065 **Net Price $0.50**

The Stock No. 7065 Alignment Wrench is a combination screwdriver and alligator jaw end wrench. The metal screwdriver bit is shaped so that it will have a minimum effect on the alignment of the set when it touches a trimmer screw. The end wrench is suitable for adjusting trimmer screws that are accessible only from the side. The shaft is of bakelite, 7/32" diameter and the overall length is 5 1/2".

Riveting Punch

Stock No. 10987 **Net Price $0.50**

The Stock No. 10987 Riveting Punch is a special metal punch for use with a riveting anvil. The punch may be used with the rivets usually used on radio receivers and permits the service man to make a factory type repair, instead of using machine screws to replace rivets. The punch is 5/16" in diameter and 5 1/2" long.

Riveting Anvil

Stock No. 10988 **Net Price $0.70**

The Stock No. 10988 Off-Set Riveting Anvil is a special anvil that permits riveting in places ordinarily inaccessible. It is to be used in conjunction with a riveting punch such as Stock No. 10987. The Anvil is 5/16" in diameter and 3 1/2" long.

Tuning Wand

Stock No. 6679 **Net Price $1.10**

The Stock No. 6679 Tuning Wand is a special alignment tool which makes possible the checking of alignment in all-wave receivers without disturbing the adjustment of the trimmer capacitors. The tool consists of a bakelite rod having a brass cylinder at one end and a special finely divided iron core at the other end. Inserting the brass cylinder into a coil lowers its inductance, while inserting the iron increases the inductance. From this it is evident that before adjusting trimmers, the adjustment may be checked by inserting each end of the wand into the coil. Proper adjustment is evidenced by a reduction in output with either end of the wand inserted into the coil.

Knurled Nut Wrench

Stock No. 10982 **Net Price $1.20**

The Stock No. 10982 Knurled Nut Wrench is a special wrench designed for tightening or removing the knurled nuts such as are used with toggle type switches. These nuts are ordinarily impossible to remove or tighten without marring. The wrench will hold a nut from 5/8" to 1/2" diameter. The overall length is 8 1/2".

Off-Set Screwdrivers

Stock No. 3064 **Net Price $0.50**

Stock No. 2930 **Net Price $0.50**

The Stock Nos. 3064 and 2930 Off-Set Screwdrivers are useful for making adjustments to remote control units and other small screws that are inaccessible with an ordinary screwdriver. The No. 3064 screwdriver is 2 1/2" long while No. 2930 has an overall length of 4 3/16".

Socket Wrench

Stock No. 10983 **Net Price $1.80**

The Stock No. 10983 Socket Wrench is a special flexible end socket wrench designed for adjusting the alignment screws of the 1929 and 1930 Victor Receivers, Models R-32, R-35, etc. The overall length is 8 3/4".

MANUFACTURED BY

RCA Victor Company, Inc.

CAMDEN, N. J., U. S. A.

Radio Tube Chart←RCA Radiotron-Cunningham→Radio Tube Chart

TYPE	NAME	BASE	SOCKET CONNECTIONS	DIMENSIONS MAXIMUM OVERALL LENGTH x DIAMETER	CATHODE TYPE ■	RATING: FILAMENT OR HEATER VOLTS	RATING: FILAMENT OR HEATER AMPERES	RATING: PLATE MAX. VOLTS	RATING: SCREEN MAX. VOLTS
RCA-1A6	PENTAGRID CONVERTER ◘	SMALL 6-PIN	FIG. 26	$4\frac{17}{32}$" x $1\frac{9}{16}$"	D-C FILAMENT	2.0	0.06	180	67.5
RCA-2A3	POWER AMPLIFIER TRIODE	MEDIUM 4-PIN	FIG. 1	$5\frac{3}{8}$" x $2\frac{1}{16}$"	FILAMENT	2.5	2.5	250	—
RCA-2A5	POWER AMPLIFIER PENTODE	MEDIUM 6-PIN	FIG. 15A	$4\frac{11}{16}$" x $1\frac{13}{16}$"	HEATER	2.5	1.75	250	250
RCA-2A6	DUPLEX-DIODE HIGH-MU TRIODE	SMALL 6-PIN	FIG. 13	$4\frac{17}{32}$" x $1\frac{9}{16}$"	HEATER	2.5	0.8	250	—
RCA-2A7	PENTAGRID CONVERTER ◘	SMALL 7-PIN	FIG. 20	$4\frac{17}{32}$" x $1\frac{9}{16}$"	HEATER	2.5	0.8	250	100
RCA-2B7	DUPLEX-DIODE PENTODE	SMALL 7-PIN	FIG. 21	$4\frac{17}{32}$" x $1\frac{9}{16}$"	HEATER	2.5	0.8	250	125
RCA-6A4 *also L.A*	POWER AMPLIFIER PENTODE	MEDIUM 5-PIN	FIG. 6	$4\frac{11}{16}$" x $1\frac{13}{16}$"	FILAMENT	6.3	0.3	180	180
RCA-6A7	PENTAGRID CONVERTER ◘	SMALL 7-PIN	FIG. 20	$4\frac{17}{32}$" x $1\frac{9}{16}$"	HEATER	6.3	0.3	250	100
RCA-6B7	DUPLEX-DIODE PENTODE	SMALL 7-PIN	FIG. 21	$4\frac{17}{32}$" x $1\frac{9}{16}$"	HEATER	6.3	0.3	250	125
RCA-6F7	TRIODE-PENTODE	SMALL 7-PIN	FIG. 27	$4\frac{17}{32}$" x $1\frac{9}{16}$"	HEATER	6.3	0.3	100 250	— 100
UX-200-A	DETECTOR TRIODE	MEDIUM 4-PIN	FIG. 1	$4\frac{11}{16}$" x $1\frac{13}{16}$"	D-C FILAMENT	5.0	0.25	45	—
RCA-01-A	DETECTOR★ AMPLIFIER	MEDIUM 4-PIN	FIG. 1	$4\frac{11}{16}$" x $1\frac{13}{16}$"	D-C FILAMENT	5.0	0.25	135	—
RCA-10	POWER AMPLIFIER TRIODE	MEDIUM 4-PIN	FIG. 1	$5\frac{5}{8}$" x $2\frac{3}{16}$"	FILAMENT	7.5	1.25	425	—
WD-11 WX-12	DETECTOR★ AMPLIFIER TRIODE	WD 4-PIN MEDIUM 4-PIN	FIG. 12 FIG. 1	$4\frac{1}{8}$" x $1\frac{3}{16}$" $4\frac{11}{16}$" x $1\frac{7}{16}$"	D-C FILAMENT	1.1	0.25	135	—
UX-112-A	DETECTOR★ AMPLIFIER TRIODE	MEDIUM 4-PIN	FIG. 1	$4\frac{11}{16}$" x $1\frac{13}{16}$"	D-C FILAMENT	5.0	0.25	180	—
RCA-19	TWIN AMPLIFIER	SMALL 6-PIN	FIG. 25	$4\frac{1}{4}$" x $1\frac{9}{16}$"	D-C FILAMENT	2.0	0.26	135	—
UX-120	POWER AMPLIFIER TRIODE	SMALL 4-PIN	FIG. 1	$4\frac{1}{8}$" x $1\frac{3}{16}$"	D-C FILAMENT	3.3	0.132	135	—
RCA-22	R-F AMPLIFIER TETRODE	MEDIUM 4-PIN	FIG. 4	$5\frac{3}{32}$" x $1\frac{13}{16}$"	D-C FILAMENT	3.3	0.132	135	67.5
RCA-24-A	R-F AMPLIFIER TETRODE	MEDIUM 5-PIN	FIG. 9	$5\frac{1}{32}$" x $1\frac{13}{16}$"	HEATER	2.5	1.75	275	90
RCA-26	AMPLIFIER TRIODE	MEDIUM 4-PIN	FIG. 1	$4\frac{11}{16}$" x $1\frac{13}{16}$"	FILAMENT	1.5	1.05	180	—
RCA-27	DETECTOR★ AMPLIFIER TRIODE	MEDIUM 5-PIN	FIG. 8	$4\frac{11}{16}$" x $1\frac{13}{16}$"	HEATER	2.5	1.75	275	—
RCA-30	DETECTOR★ AMPLIFIER TRIODE	SMALL 4-PIN	FIG. 1	$4\frac{1}{4}$" x $1\frac{9}{16}$"	D-C FILAMENT	2.0	0.06	180	—
RCA-31	POWER AMPLIFIER TRIODE	SMALL 4-PIN	FIG. 1	$4\frac{1}{4}$" x $1\frac{9}{16}$"	D-C FILAMENT	2.0	0.13	180	—
RCA-32	R-F AMPLIFIER TETRODE	MEDIUM 4-PIN	FIG. 4	$5\frac{3}{32}$" x $1\frac{13}{16}$"	D-C FILAMENT	2.0	0.06	180	67.5
RCA-33	POWER AMPLIFIER PENTODE	MEDIUM 5-PIN	FIG. 6	$4\frac{11}{16}$" x $1\frac{13}{16}$"	D-C FILAMENT	2.0	0.26	135	135
RCA-34	SUPER-CONTROL R-F AMPLIFIER PENTODE	MEDIUM 4-PIN	FIG. 4A	$5\frac{1}{32}$" x $1\frac{13}{16}$"	D-C FILAMENT	2.0	0.06	180	67.5
RCA-35	SUPER-CONTROL R-F AMPLIFIER TETRODE	MEDIUM 5-PIN	FIG. 9	$5\frac{1}{32}$" x $1\frac{13}{16}$"	HEATER	2.5	1.75	275	90

◘ Grids #3 and #5 are screen. Grid #4 is signal-input control-grid.
★For Grid-leak Detection—plate volts 45, grid return to + filament or to cathode.

★For Grid-leak Detection—plate volts 45, grid return to + filament or to cathode.
■ Either A. C. or D. C. may be used on filament or heater, except as specifically noted. For use of D. C. on A-C filament types, decrease stated grid volts by ½ (approx.) of filament voltage.

USE Values to right give operating conditions and characteristics for indicated typical use	PLATE SUPPLY VOLTS	GRID VOLTS ■	SCREEN VOLTS	SCREEN MILLI-AMP.	PLATE MILLI-AMP.	A-C PLATE RESISTANCE OHMS	MUTUAL CONDUCTANCE MICROMHOS	VOLTAGE AMPLIFICATION FACTOR	LOAD FOR STATED POWER OUTPUT OHMS	POWER OUTPUT WATTS	TYPE
CONVERTER	180	−3.0 min.	67.5	2.4	1.3	500000	Anode-Grid (#2) 135 Max. Volts, 2.3 Ma. Oscillator Grid (#1) Resistor, 50000 Ohms. Conversion Conductance, 300 Micromhos.				C-1A6
CLASS A AMPLIFIER	250	−45	——	——	60.0	300	5250	4.2	2500	3.5	C-2A3
PUSH-PULL AMPLIFIER	300	−62	Self-bias		40.0	Power Output is for 2 tubes at			5000	10.0	
	300	−62	Fixed-bias		40.0	stated load, plate-to-plate			3000	15.0	
CLASS A AMPLIFIER	250	−16.5	250	6.5	34.0	100000	2200	220	7000	3.0	C-2A5
TRIODE UNIT AS CLASS A AMPLIFIER	250 ✖	− 1.35	——	——	0.4	——	——	Gain per stage = 50-60			C-2A6
CONVERTER	250	− 3.0	100	2.2	3.5	360000	Anode Grid (#2) 200 Max. Volts, 4.0 Ma. Oscillator Grid (#1) Resistor, 50000 Ohms. Conversion Conductance, 520 Micromhos.				C-2A7
PENTODE UNIT AS R-F AMPLIFIER	100	− 3.0	100	1.7	5.8	300000	950	285	——	——	C-2B7
	250	− 3.0	125	2.3	9.0	650000	1125	730	——	——	
PENTODE UNIT AS A-F AMPLIFIER	250 ✠	− 4.5	50	——	0.65	——	——	——	——	——	
CLASS A AMPLIFIER	100	− 6.5	100	1.6	9.0	83250	1200	100	11000	0.31	C-6A4 *also L.A*
	180	−12.0	180	3.9	22.0	45500	2200	100	8000	1.40	
CONVERTER	250	− 3.0	100	2.2	3.5	360000	Anode Grid (#2) 200 Max. Volts, 4.0 Ma. Oscillator Grid (#1) Resistor, 50000 Ohms. Conversion Conductance, 520 Micromhos.				C-6A7
PENTODE UNIT AS R-F AMPLIFIER	100	− 3.0	100	1.7	5.8	300000	950	285	——	——	C-6B7
	250	− 3.0	125	2.3	9.0	650000	1125	730	——	——	
PENTODE UNIT AS A-F AMPLIFIER	250 ✠	− 4.5	50	——	0.65	——	——	——	——	——	
TRIODE UNIT AS AMPLIFIER	100	− 3.0	——	——	3.5	17800	450	8	——	——	C-6F7
PENTODE UNIT AS AMPLIFIER	250	− 3.0	100	1.5	6.5	850000	1100	900	——	——	
PENTODE UNIT AS MIXER	250	−10.0	100	0.6	2.8	Oscillator peak volts = 7.0. Conversion conductance = 300 micromhos.					
GRID LEAK DETECTOR	45	Grid Return to (−) Filament			1.5	30000	666	20	——	——	CX-300-A
CLASS A AMPLIFIER	90	− 4.5	——	——	2.5	11000	725	8.0	——	——	C-01-A
	135	− 9.0			3.0	10000	800	8.0			
CLASS A AMPLIFIER	350	−31.0	——	——	16.0	5150	1550	8.0	11000	0.9	C-10
	425	−39.0			18.0	5000	1600	8.0	10200	1.6	
CLASS A AMPLIFIER	90	− 4.5	——	——	2.5	15500	425	6.6	——	——	C-11 CX-12
	135	−10.5			3.0	15000	440	6.6			
CLASS A AMPLIFIER	90	− 4.5	——	——	5.0	5400	1575	8.5	——	——	CX-112-A
	180	−13.5			7.7	4700	1800	8.5			
CLASS B AMPLIFIER	135	0	——	——	Power output value is for one tube at stated load, plate-to-plate.				10000	2.1	C-19
	135	− 3.0							10000	1.9	
CLASS A AMPLIFIER	90	−16.5	——	——	3.0	8000	415	3.3	9600	0.045	CX-220
	135	−22.5			6.5	6300	525	3.3	6500	0.110	
SCREEN GRID R-F AMPLIFIER	135	− 1.5	45	0.6*	1.7	725000	375	270	——	——	C-22
	135	− 1.5	67.5	1.3*	3.7	325000	500	160			
SCREEN GRID R-F AMPLIFIER	180	− 3.0	90	1.7*	4.0	400000	1000	400	——	——	C-24-A
	250	− 3.0	90	1.7*	4.0	600000	1050	630			
BIAS DETECTOR	275●	− 5.0 approx.	20 to 45	——	Plate current to be adjusted to 0.1 milliampere with no signal.						
CLASS A AMPLIFIER	90	− 7.0	——	——	2.9	8900	935	8.3	——	——	C-26
	180	−14.5			6.2	7300	1150	8.3			
CLASS A AMPLIFIER	135	− 9.0	——	——	4.5	9000	1000	9.0	——	——	C-27
	250	−21.0			5.2	9250	975	9.0			
BIAS DETECTOR	250	−30.0	——	——	Plate current to be adjusted to 0.2 milliampere with no signal.						
CLASS A AMPLIFIER	90	− 4.5			2.5	11000	850	9.3			C-30
	135	− 9.0	——	——	3.0	10300	900	9.3	——	——	
	180	−13.5			3.1	10300	900	9.3			
CLASS A AMPLIFIER	135	−22.5	——	——	8.0	4100	925	3.8	7000	0.185	C-31
	180	−30.0			12.3	3600	1050	3.8	5700	0.375	
SCREEN GRID R-F AMPLIFIER	135	− 3.0	67.5	0.4*	1.7	950000	640	610	——	——	C-32
	180	− 3.0	67.5	0.4*	1.7	1200000	650	780			
BIAS DETECTOR	180▼	− 6.0 approx.	67.5	——	Plate current to be adjusted to 0.2 milliampere with no signal.						
CLASS A AMPLIFIER	135	−13.5	135	3.0	14.5	50000	1450	70	7000	0.7	C-33
SCREEN GRID R-F AMPLIFIER	135	− 3.0 min.	67.5	1.0	2.8	600000	600	360	——	——	C-34
	180		67.5	1.0	2.8	1000000	620	620			
SCREEN GRID R-F AMPLIFIER	180	− 3.0 min.	90	2.5*	6.3	300000	1020	305	——	——	C-35
	250		90	2.5*	6.5	400000	1050	420			

✠Applied through plate coupling resistor of 200000 ohms.
✖Applied through plate coupling resistor of 250000 ohms.

●Applied through plate coupling resistor of 250000 ohms or 500-henry choke shunted by 0.25 megohm resistor.
▼Applied through plate coupling resistor of 100000 ohms.
*Maximum.

Radio Tube Chart (Continued) ← RCA Radiotron - Cunningham → Radio Tube Chart (Continued)

TYPE	NAME	BASE	SOCKET CONNECTIONS	DIMENSIONS MAXIMUM OVERALL LENGTH × DIAMETER	CATHODE TYPE ■	RATING: FILAMENT OR HEATER VOLTS	RATING: FILAMENT OR HEATER AMPERES	RATING: PLATE MAX. VOLTS	RATING: SCREEN MAX. VOLTS
RCA- 36	R-F AMPLIFIER TETRODE	SMALL 5-PIN	FIG. 9	$4\frac{17}{32}$" x $1\frac{9}{16}$"	HEATER	6.3	0.3	250	90
RCA- 37	DETECTOR★ AMPLIFIER TRIODE	SMALL 5-PIN	FIG. 8	$4\frac{1}{4}$" x $1\frac{9}{16}$"	HEATER	6.3	0.3	250	—
RCA- 38	POWER AMPLIFIER PENTODE	SMALL 5-PIN	FIG. 9A	$4\frac{17}{32}$" x $1\frac{9}{16}$"	HEATER	6.3	0.3	250	250
RCA-39-44	SUPER-CONTROL R-F AMPLIFIER PENTODE	SMALL 5-PIN	FIG. 9A	$4\frac{17}{32}$" x $1\frac{9}{16}$"	HEATER	6.3	0.3	250	90
UX -240	VOLTAGE AMPLIFIER TRIODE	MEDIUM 4-PIN	FIG. 1	$4\frac{11}{16}$" x $1\frac{13}{16}$"	D-C FILAMENT	5.0	0.25	180	—
RCA- 41	POWER AMPLIFIER PENTODE	SMALL 6-PIN	FIG. 15A	$4\frac{1}{4}$" x $1\frac{9}{16}$"	HEATER	6.3	0.4	250	250
RCA- 42	POWER AMPLIFIER PENTODE	MEDIUM 6-PIN	FIG. 15A	$4\frac{11}{16}$" x $1\frac{13}{16}$"	HEATER	6.3	0.7	250	250
RCA- 43	POWER AMPLIFIER PENTODE	MEDIUM 6-PIN	FIG. 15A	$4\frac{11}{16}$" x $1\frac{13}{16}$"	HEATER	25.0	0.3	135	135
RCA- 45	POWER AMPLIFIER TRIODE	MEDIUM 4-PIN	FIG. 1	$4\frac{11}{16}$" x $1\frac{13}{16}$"	FILAMENT	2.5	1.5	275	—
RCA- 46	DUAL-GRID POWER AMPLIFIER	MEDIUM 5-PIN	FIG. 7	$5\frac{5}{8}$" x $2\frac{7}{16}$"	FILAMENT	2.5	1.75	250	—
								400	—
RCA- 47	POWER AMPLIFIER PENTODE	MEDIUM 5-PIN	FIG. 6	$5\frac{5}{8}$" x $2\frac{3}{16}$"	FILAMENT	2.5	1.75	250	250
RCA- 48	POWER AMPLIFIER TETRODE	MEDIUM 6-PIN	FIG. 15	$5\frac{3}{8}$" x $2\frac{7}{16}$"	D-C HEATER	30.0	0.4	125	100
★For Grid-leak Detection—plate volts 45, grid return to + filament or to cathode.									
RCA- 49	DUAL-GRID POWER AMPLIFIER	MEDIUM 5-PIN	FIG. 7	$4\frac{11}{16}$" x $1\frac{13}{16}$"	D-C FILAMENT	2.0	0.120	135	—
								180	—
UX -250	POWER AMPLIFIER TRIODE	MEDIUM 4-PIN	FIG. 1	$6\frac{1}{4}$" x $2\frac{11}{16}$"	FILAMENT	7.5	1.25	450	—
RCA- 53	TWIN-TRIODE AMPLIFIER	MEDIUM 7-PIN#	FIG. 24	$4\frac{11}{16}$" x $1\frac{13}{16}$"	HEATER	2.5	2.0	300	—
RCA- 55	DUPLEX-DIODE TRIODE	SMALL 6-PIN	FIG. 13	$4\frac{17}{32}$" x $1\frac{9}{16}$"	HEATER	2.5	1.0	250	—
RCA- 56	SUPER-TRIODE AMPLIFIER DETECTOR★	SMALL 5-PIN	FIG. 8	$4\frac{1}{4}$" x $1\frac{9}{16}$"	HEATER	2.5	1.0	250	—
RCA- 57	TRIPLE-GRID AMPLIFIER DETECTOR	SMALL 6-PIN	FIG. 11	$4\frac{15}{16}$" x $1\frac{9}{16}$"	HEATER	2.5	1.0	250	100
RCA- 58	TRIPLE-GRID SUPER-CONTROL AMPLIFIER	SMALL 6-PIN	FIG. 11	$4\frac{15}{16}$" x $1\frac{9}{16}$"	HEATER	2.5	1.0	250	100
RCA- 59	TRIPLE-GRID POWER AMPLIFIER	MEDIUM 7-PIN#	FIG. 18	$5\frac{3}{8}$" x $2\frac{1}{16}$"	HEATER	2.5	2.0	250	—
								250	250
								400	—
RCA- 71-A	POWER AMPLIFIER TRIODE	MEDIUM 4-PIN	FIG. 1	$4\frac{11}{16}$" x $1\frac{13}{16}$"	FILAMENT	5.0	0.25	180	—
RCA- 75	DUPLEX-DIODE HIGH-MU TRIODE	SMALL 6-PIN	FIG. 13	$4\frac{17}{32}$" x $1\frac{9}{16}$"	HEATER	6.3	0.3	250	—
RCA- 77	TRIPLE-GRID AMPLIFIER DETECTOR	SMALL 6-PIN	FIG. 11	$4\frac{17}{32}$" x $1\frac{9}{16}$"	HEATER	6.3	0.3	250	100
RCA- 78	TRIPLE-GRID SUPER-CONTROL AMPLIFIER	SMALL 6-PIN	FIG. 11	$4\frac{17}{32}$" x $1\frac{9}{16}$"	HEATER	6.3	0.3	250	125

★For Grid-leak Detection—plate volts 45, grid return to + filament or to cathode.
■ Either A. C. or D. C. may be used on filament or heater, except as specifically noted. For use of D. C. on A-C filament types, decrease stated grid volts by ½ (approx.) of filament voltage.
Requires different socket from small 7-pin.

USE (Values to right give operating conditions and characteristics for indicated typical use)	PLATE SUPPLY VOLTS	GRID VOLTS ■	SCREEN VOLTS	SCREEN MILLI-AMP.	PLATE MILLI-AMP.	A-C PLATE RESISTANCE OHMS	MUTUAL CONDUCTANCE MICROMHOS	VOLTAGE AMPLIFICATION FACTOR	LOAD FOR STATED POWER OUTPUT OHMS	POWER OUTPUT WATTS	TYPE
SCREEN GRID R-F AMPLIFIER	100 180 250	− 1.5 − 3.0 − 3.0	55 90 90	—— —— 1.7*	1.8 3.1 3.2	550000 500000 550000	850 1050 1080	470 525 595	——	——	C - 36
BIAS DETECTOR	100● 250●	− 5.0 − 8.0	55 90	——	Plate current to be adjusted to 0.1 milliampere with no signal.						
CLASS A AMPLIFIER	90 180 250	− 6.0 −13.5 −18.0	——	——	2.5 4.3 7.5	11500 10200 8400	800 900 1100	9.2 9.2 9.2	——	——	C - 37
BIAS DETECTOR	90 250	−10.0 −28.0	——	——	Plate current to be adjusted to 0.2 milliampere with no signal.						
CLASS A AMPLIFIER	100 180 250	− 9.0 −18.0 −25.0	100 180 250	1.2 2.4 3.8	7.0 14.0 22.0	140000 110000 100000	875 1050 1200	120 120 120	15000 11600 10000	0.27 1.00 2.50	C - 38
SCREEN GRID R-F AMPLIFIER	90 180 250	{ − 3.0 min. }	90 90 90	1.6 1.4 1.4	5.6 5.8 5.8	375000 750000 1000000	960 1000 1050	360 750 1050	——	——	C -39-44
CLASS A AMPLIFIER	135✖ 180✖	− 1.5 − 3.0	——	——	0.2 0.2	150000 150000	200 200	30 30	——	——	CX-340
CLASS A AMPLIFIER	100 180 250	− 7.0 −13.5 −18.0	100 180 250	1.6 3.0 5.5	9.0 18.5 32.0	103500 81000 68000	1450 1850 2200	150 150 150	12000 9000 7600	0.33 1.50 3.40	C - 41
CLASS A AMPLIFIER	250	−16.5	250	6.5	34.0	100000	2200	220	7000	3.00	C - 42
CLASS A AMPLIFIER	100 135	−15.0 −20.0	100 135	4.0 7.0	20.0 34.0	45000 35000	2000 2300	90 80	4500 4000	0.90 2.00	C - 43
CLASS A AMPLIFIER	180 250 275	−31.5 −50.0 −56.0	180 250 275	——	31.0 34.0 36.0	1650 1610 1700	2125 2175 2050	3.5 3.5 3.5	2700 3900 4600	0.82 1.60 2.00	C - 45
CLASS A AMPLIFIER □	250	−33.0	——	——	22.0	2380	2350	5.6	6400	1.25	
CLASS B AMPLIFIER ♦	300 400	0 0	——	——	Power output values are for 2 tubes at indicated plate-to-plate load.				5200 5800	16.0 20.0	C - 46
CLASS A AMPLIFIER	250	−16.5	250	6.0	31.0	60000	2500	150	7000	2.7	C - 47
CLASS A AMPLIFIER	95 125	−20.0 −22.5	95 100	9.0 9.0	47.0 50.0	10000 10000	2800 2800	28 28	2000 2000	1.6 2.5	C - 48
● Applied through plate coupling resistor of 250000 ohms or 500-henry choke shunted by 0.25 megohm resistor.											
✖ Applied through plate coupling resistor of 250000 ohms. ♦ Two grids tied together. *Maximum.											
CLASS A AMPLIFIER □	135	−20.0	——	——	5.7	4000	1125	4.5	11000	0.17	C - 49
CLASS B AMPLIFIER ♦	180	0	——	——	Power output values are for 2 tubes at indicated plate-to-plate load.				12000	3.5	
CLASS A AMPLIFIER	300 400 450	−54.0 −70.0 −84.0	——	——	35.0 55.0 55.0	2000 1800 1800	1900 2100 2100	3.8 3.8 3.8	4600 3670 4350	1.6 3.4 4.6	CX-350
CLASS B AMPLIFIER	250 300	0 0	——	——	Power output value is for one tube at stated load, plate-to-plate.				8000 10000	8.0 10.0	C - 53
TRIODE UNIT AS CLASS A AMPLIFIER	135 180 250	−10.5 −13.5 −20.0	——	——	3.7 6.0 8.0	11000 8500 7500	750 975 1100	8.3 8.3 8.3	25000 20000 20000	0.075 0.160 0.350	C - 55
CLASS A AMPLIFIER	250	−13.5	——	——	5.0	9500	1450	13.8	——	——	C - 56
BIAS DETECTOR	250	−20.0	——	——	Plate current to be adjusted to 0.2 milliampere with no signal.						
SCREEN GRID R-F AMPLIFIER	250	− 3.0	100	0.5	2.0	exceeds 1.5 meg.	1225	exceeds 1500	——	——	C - 57
BIAS DETECTOR	250	− 3.9	100	Cathode current 0.97 ma.	——		Plate coupling resistor 250000 ohms. Grid coupling resistor 250000 ohms**.				
SCREEN GRID R-F AMPLIFIER	250	{ − 3.0 min. }	100	2.0	8.2	800000	1600	1280	——	——	C - 58
MIXER IN SUPERHETERODYNE	250	−10.0	100	——	——	Oscillator peak volts = 7.0.					
AS TRIODE ¶ CLASS A AMPLIFIER	250	−28.0	——	——	26.0	2400	2600	6.0	5000	1.25	C - 59
AS PENTODE ■■ CLASS A AMPLIFIER	250	−18.0	250	9.0	35.0	40000	2500	100	6000	3.00	
AS TRIODE ● CLASS B AMPLIFIER	300 400	0 0	——	——	Power output values are for 2 tubes at indicated plate-to-plate load.				4600 6000	15.0 20.0	
CLASS A AMPLIFIER	90 180	−19.0 −43.0	——	——	10.0 20.0	2170 1750	1400 1700	3.0 3.0	3000 4800	0.125 0.790	C - 71-A
TRIODE UNIT AS CLASS A AMPLIFIER	250✖	−1.35	——	——	0.4	——	——	Gain per stage = 50-60			C - 75
SCREEN GRID R-F AMPLIFIER	100 250	− 1.5 − 3.0	60 100	0.4 0.6	1.7 2.3	650000 1500000	1100 1250	715 1500	——	——	C - 77
BIAS DETECTOR	250	− 1.95	50	Cathode current 0.65 ma.	——		Plate coupling resistor 250000 ohms. Grid coupling resistor 250000 ohms**.				
SCREEN GRID R-F AMPLIFIER	90 180 250 250	{ − 3.0 min. }	90 75 100 125	1.5 1.0 2.0 3.0	5.4 4.0 7.0 10.5	315000 1000000 800000 600000	1275 1100 1450 1650	400 1100 1160 990	——	——	C - 78

■■ Grid #1 is control grid. Grid #2 is screen. Grid #3 tied to cathode. ♦ Two grids tied together.
¶ Grid #1 is control grid. Grids #2 and #3 tied to plate. ✖ Applied through plate coupling resistor of 250000 ohms.
● Grids #1 and #2 connected together. Grid #3 tied to plate. **For grid of following tube.

Radio Tube Chart (Continued)←RCA Radiotron-Cunningham→Radio Tube Chart (Continued)

TYPE	NAME	BASE	SOCKET CONNECTIONS	DIMENSIONS MAXIMUM OVERALL LENGTH X DIAMETER	CATHODE TYPE ■	RATING: FILAMENT OR HEATER VOLTS	FILAMENT OR HEATER AMPERES	PLATE MAX. VOLTS	SCREEN MAX. VOLTS
RCA- 79	TWIN-TRIODE AMPLIFIER	SMALL 6-PIN	FIG. 19	$4\frac{17}{32}$" x $1\frac{9}{16}$"	HEATER	6.3	0.6	250	—
RCA- 85	DUPLEX-DIODE TRIODE	SMALL 6-PIN	FIG. 13	$4\frac{17}{32}$" x $1\frac{9}{16}$"	HEATER	6.3	0.3	250	—
RCA- 89	TRIPLE-GRID POWER AMPLIFIER	SMALL 6-PIN	FIG. 14	$4\frac{17}{32}$" x $1\frac{9}{16}$"	HEATER	6.3	0.4	250	250
UV -199 UX -199	DETECTOR★ AMPLIFIER TRIODE	SMALL 4-NUB SMALL 4-PIN	FIG. 10 FIG. 1	$3\frac{1}{2}$" x $1\frac{1}{16}$" $4\frac{1}{8}$" x $1\frac{3}{16}$"	D-C FILAMENT	3.3	0.063	90	—
RCA-864	AMPLIFIER TRIODE	SMALL 4-PIN	FIG. 1	4" x $1\frac{9}{16}$"	D-C FILAMENT	1.1	0.25	135	—

★For Grid-leak Detection—plate volts 45, grid return to + filament or to cathode.
■Either A. C. or D. C. may be used on filament or heater, except as specifically noted. For use of D. C. on A-C filament types, decrease stated grid volts by ½ (approx.) of filament voltage.

RECTIFIERS

RCA-5Z3	FULL-WAVE RECTIFIER	MEDIUM 4-PIN	FIG. 2	$5\frac{3}{8}$" x $2\frac{1}{16}$"	FILAMENT	5.0	3.0	—	—
RCA-12Z3	HALF-WAVE RECTIFIER	SMALL 4-PIN	FIG. 22	$4\frac{1}{4}$" x $1\frac{9}{16}$"	HEATER	12.6	0.3	—	—
RCA-25Z5	RECTIFIER-DOUBLER	SMALL 6-PIN	FIG. 5	$4\frac{1}{4}$" x $1\frac{9}{16}$"	HEATER	25.0	0.3	—	—
RCA-1-V°	HALF-WAVE RECTIFIER	SMALL 4-PIN	FIG. 22	$4\frac{1}{4}$" x $1\frac{9}{16}$"	HEATER	6.3	0.3	—	—
RCA- 80	FULL-WAVE RECTIFIER	MEDIUM 4-PIN	FIG. 2	$4\frac{11}{16}$" x $1\frac{13}{16}$"	FILAMENT	5.0	2.0	—	—
UX -281	HALF-WAVE RECTIFIER	MEDIUM 4-PIN	FIG. 3	$6\frac{1}{4}$" x $2\frac{7}{8}$"	FILAMENT	7.5	1.25	—	—
RCA- 82	FULL-WAVE➤ RECTIFIER	MEDIUM 4-PIN	FIG. 2	$4\frac{11}{16}$" x $1\frac{13}{16}$"	FILAMENT	2.5	3.0	—	—
RCA- 83	FULL-WAVE➤ RECTIFIER	°MEDIUM 4-PIN	FIG. 2	$5\frac{3}{8}$" x $2\frac{1}{16}$"	FILAMENT	5.0	3.0	—	—
RCA- 84 *also 6Z4*	FULL-WAVE RECTIFIER	SMALL 5-PIN	FIG. 23	$4\frac{1}{4}$" x $1\frac{9}{16}$"	HEATER	6.3	0.5	—	—
RCA-866	HALF-WAVE➤ RECTIFIER	MEDIUM 4-PIN	FIG. 3 See Note ⊟	$6\frac{5}{8}$" x $2\frac{7}{16}$"	FILAMENT	2.5	5.0	—	—

➤Mercury Vapor Type. ° Interchangeable with type 1.
⊟ Plate connection made to top cap of tube.

PHOTOTUBES

RCA-868	PHOTOTUBE	SMALL 4-PIN	FIG. 1 See Note➤	$4\frac{1}{8}$" x $1\frac{3}{16}$"	Note: Pins No. 1 and No. 3—No Connections, Pin No. 2—Anode (+), Pin No. 4—Cathode (—).

INDEX OF TYPES BY USE AND BY CATHODE VOLTAGE

CATHODE VOLTS	POWER AMPLIFIERS	VOLTAGE AMPLIFIERS *Including Duplex-Diode Types*	CONVERTERS IN SUPERHETERODYNES
1.1	———	11, 12, 864	——
1.5	———	26	——
2.0	19, 31, 33, 49	30, 32, 34	1A6
2.5	2A3, 2A5, 45, 46, 47, 53, 59	2A6, 2B7, 24-A, 27, 35, 55, 56, 57, 58	2A7
3.3	'20	22, '99	——
5.0	112-A, 71-A	01-A, '40, 112-A	——
6.3	6A4, 38, 41, 42, 79, 89	6B7, 6F7, 36, 37, 39-44, 75, 77, 78, 85	6A7, 6F7
7.5	10, '50	———	——
12.6	———	———	——
25.0	43	———	——
30.0	48	———	——

USE Values to right give operating conditions and characteristics for indicated typical use	PLATE SUPPLY VOLTS	GRID VOLTS ■	SCREEN VOLTS	SCREEN MILLI-AMP.	PLATE MILLI-AMP.	A-C PLATE RESISTANCE OHMS	MUTUAL CONDUCTANCE MICROMHOS	VOLTAGE AMPLIFICATION FACTOR	LOAD FOR STATED POWER OUTPUT OHMS	POWER OUTPUT WATTS	TYPE
CLASS B AMPLIFIER	180 250	0 0	——	——	Power output value is for one tube at stated load, plate-to-plate.				7000 14000	5.5 8.0	C - 79
TRIODE UNIT AS CLASS A AMPLIFIER	135 180 250	−10.5 −13.5 −20.0	——	——	3.7 6.0 8.0	11000 8500 7500	750 975 1100	8.3 8.3 8.3	25000 20000 20000	0.075 0.160 0.350	C - 85
AS TRIODE ¶ CLASS A AMPLIFIER	160 180 250	−20.0 −22.5 −31.0	——	——	17.0 20.0 32.0	3300 3000 2600	1425 1550 1800	4.7 4.7 4.7	7000 6500 5500	0.300 0.400 0.900	C - 89
AS PENTODE ■■ CLASS A AMPLIFIER	100 180 250	−10.0 −18.0 −25.0	100 180 250	1.6 3.0 5.5	9.5 20.0 32.0	104000 80000 70000	1200 1550 1800	125 125 125	10700 8000 6750	0.33 1.50 3.40	
AS TRIODE ° CLASS B AMPLIFIER	180	0	——	——	Power output values are for 2 tubes operating at indicated plate-to-plate load.				13600 9400	2.50 3.50	
CLASS A AMPLIFIER	90	− 4.5	——	——	2.5	15500	425	6.6	——	——	C -299 CX-299
CLASS A AMPLIFIER	90 135	− 4.5 − 9.0	——	——	2.9 3.5	13500 12700	610 645	8.2 8.2	——	——	C -864

■■Grid #1 is control grid. Grid #2 is screen. Grid #3 tied to cathode
¶Grid #1 is control grid. Grids #2 and #3 tied to plate.
°Grids #1 and #2 connected together. Grid #3 tied to plate.

RECTIFIERS

Maximum A-C Voltage per Plate.....500 Volts, RMS Maximum D-C Output Current.....250 Milliamperes	C -5Z3
Maximum A-C Voltage per Plate.....250 Volts, RMS Maximum D-C Output Current..... 60 Milliamperes	C-12Z3
Maximum A-C Voltage per Plate.....125 Volts, RMS Maximum D-C Output Current.....100 Milliamperes	C-25Z5
Maximum A-C Voltage per Plate.....350 Volts, RMS Maximum D-C Output Current..... 50 Milliamperes	C-1V°
A-C Voltage per Plate (Volts RMS).. 350 400 550 D-C Output Current (Maximum MA.) 125 110 135 The 550 volt rating applies to filter circuits having an input choke of at least 20 henries.	C - 80
Maximum A-C Plate Voltage.....700 Volts, RMS Maximum D-C Output Current..... 85 Milliamperes	CX-381
Maximum A-C Voltage per Plate.....500 Volts, RMS Maximum D-C Output Current.....125 Milliamperes Maximum Peak Inverse Voltage.....1400 Volts Maximum Peak Plate Current..... 400 Milliamperes	C - 82
Maximum A-C Voltage per Plate.....500 Volts, RMS Maximum D-C Output Current.....250 Milliamperes Maximum Peak Inverse Voltage.....1400 Volts Maximum Peak Plate Current..... 800 Milliamperes	C - 83
Maximum A-C Voltage per Plate.....225 Volts, RMS Maximum D-C Output Current..... 50 Milliamperes	C - 84 *also 6Z4*
Maximum Peak Inverse Voltage.....7500 Volts Maximum Peak Plate Current.....0.6 Ampere	C -866 (CX-366)

PHOTOTUBES

Max. Anode Supply Voltage, 90 Volts. Max. Anode Current, 20 Microamperes. Static Sensitivity, 55 Microamperes per Lumen. Dynamic Sensitivity, 50 and 48 Microamperes per Lumen at 1000 and 5000 Cycles per second, respectively.	C -868

INDEX OF TYPES BY USE AND BY CATHODE VOLTAGE

DETECTORS	MIXER TUBES IN SUPERHETERODYNES	RECTIFIERS	CATHODE VOLTS
11, 12, 864	———	——	1.1
———	———	——	1.5
30, 32	1A6, 34	——	2.0
2A6, 2B7, 24-A, 27, 55, 56, 57	2A7, 35, 58	82,866 (C-366)	2.5
'99	———	——	3.3
00-A, 01-A, '40, 112-A	———	5Z3, 80, 83	5.0
6B7, 6F7, 36, 37, 75, 77, 85	6A7, 6F7, 39-44, 78	1-v, 84	6.3
———	———	'81	7.5
———	———	12Z3	12.6
———	———	25Z5	25.0
———	———	——	30.0

Tube Symbols and Bottom Views of Socket Connections

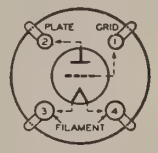


FIG. 1

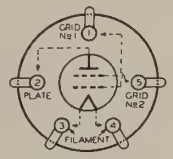


FIG. 7

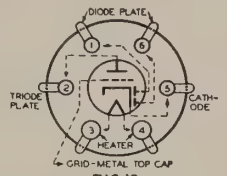


FIG. 13

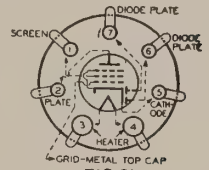


FIG. 21

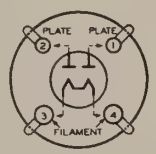


FIG. 2

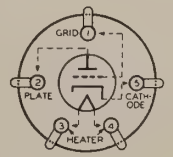


FIG. 8

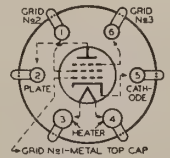


FIG. 14

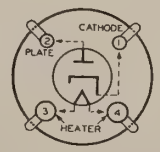


FIG. 22

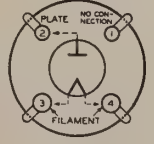


FIG. 3

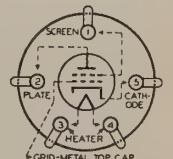


FIG. 9

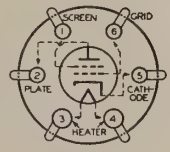


FIG. 15

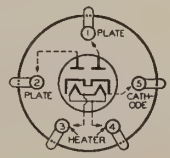


FIG. 23

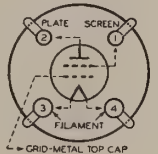


FIG. 4

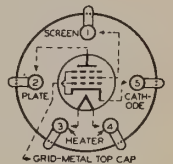


FIG. 9A

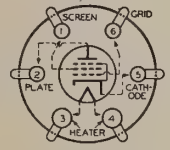


FIG. 15A

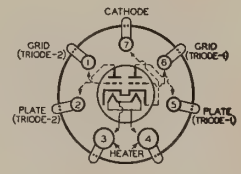


FIG. 24

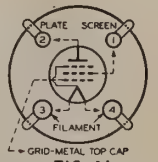


FIG. 4A

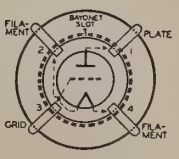


FIG. 10

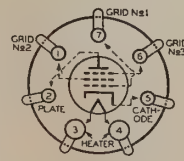


FIG. 18

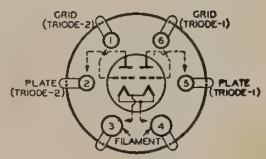


FIG. 25

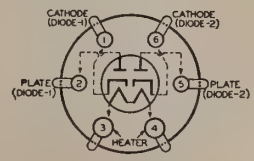


FIG. 5

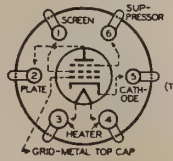


FIG. 11

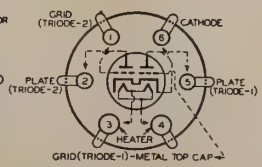


FIG. 19

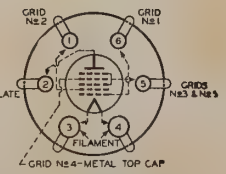


FIG. 26

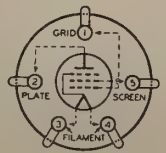


FIG. 6

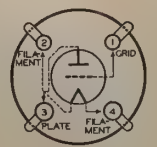


FIG. 12

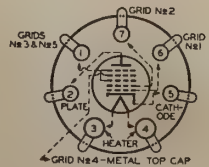


FIG. 20

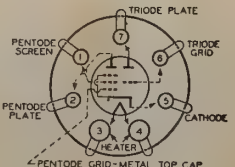
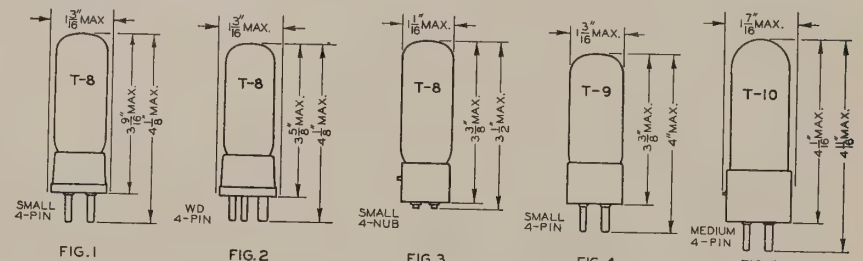


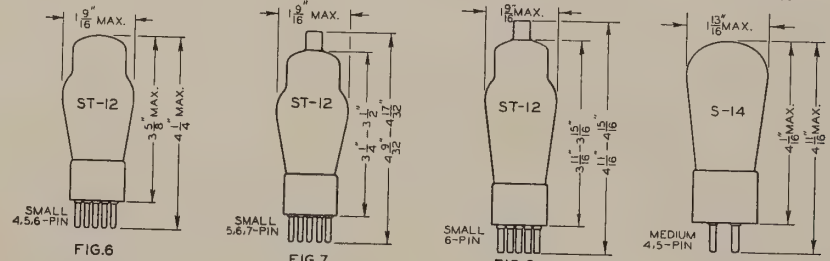
FIG. 27

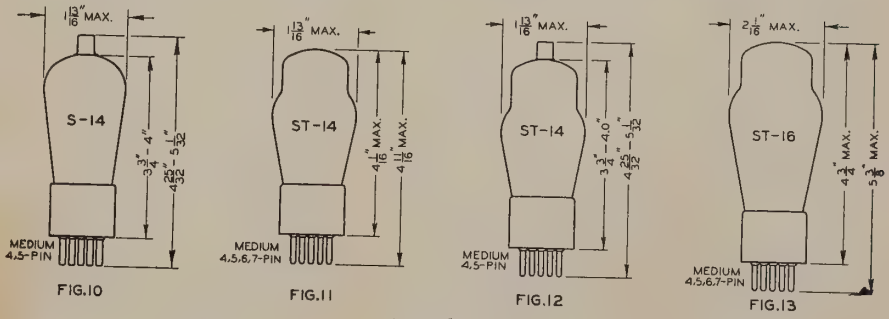
Outline Dimensions of RCA Radiotron and Cunningham Radio Tube Types

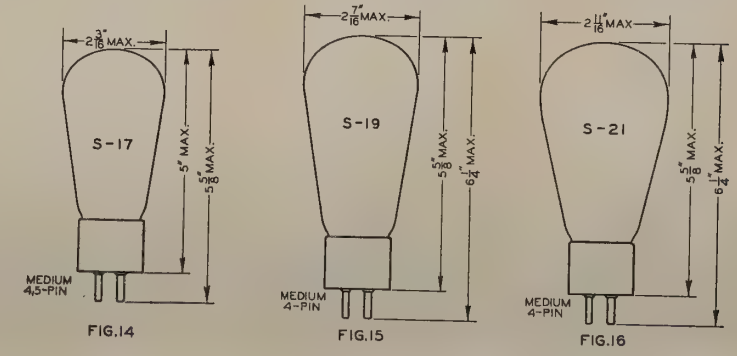
This chart of tube dimensions is to be used in conjunction with the text. The bulb reference number for each tube is given under its CHARACTERISTICS.

The prefix letters of the bulb designation indicate the bulb shape; as S for "straight side," T for "tubular," ST for a combination of tubular and straight side, or "dome type." The suffix numbers of the bulb designations indicate the nominal maximum diameter of the bulb in eighths of inches, i.e., the diameter of the S-12 is 12 eighths, or 1½".









RCA VICTOR DUAL-SPEED TURNTABLE MODELS SR-1, SR-2 AND SR-3 REPLACEMENT PARTS LIST

The RCA Victor Dual Speed Turntables are replacement units for standard phonograph turntables designed to permit operation at either 33 1/3 R.P.M. or 78 R.P.M. Instructions for installing these turntables are contained with the equipment. The following lists show the replacement parts available for repairs. Due to the simplicity of the device, Service notes will not be issued.

Stock No.	Description	List Price
3338	Ring ---- Clamp ring assembly - Comprising spring, latch lever and stud (used on SR-1, 2 and 3)	$0.60
3339	Sleeve ---- Sleeve complete with ball race (used on SR-2 only)	3.25
3340	Washer ---- Thrust washer (used on SR-1, 2 and 3) - Package of 2	.60
3341	Pin --- Groove pin (used on SR-1, 2 and 3) - Package of 2	.60
3342	Spring --- Latch spring located on clamping ring (used on SR-1, 2 and 3) - Package of 2	.60
3343	Sleeve --- Sleeve assembly complete with ball race (used on SR-1 and 3)	3.25
3344	Cover --- Grease retainer cover (used on SR-1, 2 and 3) - Package of 2	.70
3345	Lever --- Speed shifter lever with mounting screws (used on SR-1, 2 and 3)	.60
3346	Bushing --- Speed shifter lever bushing - Package of 4 (used on SR-1, 2 and 3)	.70
3347	Spring --- Speed shifter lever spring (used on SR-1, 2 and 3) - Package of 2	.65
3348	Bushing --- Turntable drive bushing with set screw (used on SR-2 only)	.65
3349	Weight --- Counter weight for inertia arm (used on SR-1 and 2)	1.60
3350	Weight --- Counter weight for straight arm (used on SR-3)	1.40

SERVICE DIVISION
RCA Victor COMPANY, INC.,
Camden, N. J.

SERVICE NOTES

for

RCA Victor

Two Speed Replacement Motor Boards

Nos. 1, 2 and 3

RCA Victor Two Speed Replacement Motor Boards are designed for replacement use in conjunction with old phonograph models.

The necessary instructions for making this change are given in the instruction sheet accompanying each instrument. The following list contains the replacement parts that may be required when service work is performed.

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
X-50	Board—No. 1 motor board—For RE-57 and Radiola 80, etc.—Less all parts	$5.25
X-51	Board—No. 2 motor board—For RE-73—Less all parts	5.25
X-52	Board—No. 3 motor board—Universal—Less all parts	5.50
2758	Cup—Needle cup—Package of 2	.50
2908	Spring—Pawl carrier spring—Package of 10	.50
3157	Gear — Driving gear — Located on turntable spindle above top plate	1.00
3159	Friction brake—Gear reducing friction brake spring with pad—Complete with mounting rivet—Package of 4	2.00
3160	Escutcheon—Speed escutcheon plate with mounting screws—Package of 2	.90
3161	Spring—Shift lever spring—Package of 5	1.20
3211	Washer—Turntable spindle leather washer—Package of 10	.50
3212	Spring—Turntable spindle plunger spring—Package of 10	.50
3278	Bearing—Rotor shaft fibre thrust bearing and cork button—Package of 10	.50
3279	Screw and nut—Rotor shaft thrust bearing adjusting screw and lock nut—Package of 10	.50
3280	Washer—Metal washer—Located on turntable spindle underneath gear reducing unit—Package of 20	.50
3281	Pawl — Gear reducing pawl with mounting stud	.50
6119	Stud—Motor hanging stud—Package of 6	.50
6120	Screw—For holding turntable spindle bearing and grease cap—Package of 10	$ .50
6121	Bearing—Turntable spindle bearing and grease cap	1.10
6194	Weight—Counter balance weight—Complete with two mounting rivets —For suspension type pickup arm	.95
6195	Weight—Counter balance weight complete with mounting screw and nut For inertia type pickup arm	.95
7084	Turntable covering	.50
7305	Gear—Gear reducing unit complete	4.50
7388	Spindle—Turntable spindle with fibre gear—60 cycles	6.00
7389	Rotor and shaft—60 cycles	9.00
7390	Motor mounting washer and spring—Comprising 3 "C" washers, 9 cup washers and 6 springs—Package of 1 set	.75
7400	Spindle—Turntable spindle with fibre gear—25 cycles	8.00
7401	Rotor and shaft—25 cycles	10.00
7443	Rotor and shaft—50 cycles	9.00
7444	Spindle—Turntable spindle with fibre gear—50 cycles	6.00
8731	Lever—Shift lever assembly complete	1.60
8733	Turntable—Turntable with cover	4.60
8795	Motor—Motor complete—110 volts—60 cycles	19.85
8800	Motor—Motor complete—110 volts—25 cycles	24.65
8856	Motor—Motor complete—110 volts——50 cycles	19.85

Service Division

RCA Victor Company, Inc.

Camden, N. J., U. S. A.

S. O. 8832 5M—2-3-'32

Instructions for

RCA Victor Portable Victrola

Model 2-19

SETUP

Remove the Victrola from its shipping carton and place on a table or other level surface of convenient height. Then raise the cabinet lid and withdraw all packing material used to secure parts rigidly for transit.

INITIAL OPERATION

The motor-winding key is located between the tone arm bearing and the turntable, a hole in the motorboard being provided to hold the key in place when carrying the phonograph. Remove key, insert in winding-shaft socket at rear of turntable and wind motor by turning key slowly in a clockwise direction. In order to wind the motor completely, it will be necessary to apply the turntable brake; otherwise, rotation will ensue during the winding process. The brake is operated by a lever protruding from beneath the turntable at the front.

Always be careful not to wind the motor too tightly. Stop immediately when winding becomes appreciably difficult. After the initial winding, release the brake and permit the motor to run down; then apply the brake and rewind, repeating this process two or three times to assure free working of parts. Leave the tone-arm with its reproducer (or sound-box) in the metallic rest at the side of the turntable during this preliminary operation.

PLAYING

1. Wind the motor as outlined under "Initial Operation."

2. Insert a *new* needle in the reproducer to the full depth of the opening and tighten the needle screw. For best reproduction, use only RCA Victor needles—Chromium (green shank), Tungstone (full volume) or the ordinary *full volume* steel. Books of Chromium or Tungstone needles may be kept in the holder attached to the motor board.

NOTE—With care, a Chromium needle should play 75 to 100 and a Tungstone needle 100 to 200 recordings. Never re-insert a Chromium needle which has been used (however slightly) as damage to the record grooves would result. Thin flexible or transparent-faced (illustrated) records should not be reproduced with Tungstone needles. If steel needles are used, a new needle should be substituted after each selection.

3. Place a record on the turntable. Victor records are noted for quality and will provide greatest satisfaction.

4. Start the motor by releasing the turntable brake. Place the reproducer gently on the record so that the needle rests on the smooth outer rim, then guide the needle into the outside groove.

5. When the selection has been played, stop the motor by applying the turntable brake, then return the reproducer to its metallic rest at the side of the turntable. The reproducer should not be allowed to remain on the record or turntable when the phonograph is not in use.

Speed—The correct speed of the turntable is 78 revolutions per minute while playing. To check this, place a piece of paper under the edge of the record on the turntable. While playing the record, count the revolutions during one minute. The speed regulator may be moved toward "F" to increase, or toward "S" to decrease the speed until the revolutions per minute are correct.

GENERAL INFORMATION

1. Facilities for carrying a number of records with the Victrola are provided. Up to twelve 10-inch diameter records may be stored in the lid pocket of the cabinet.

2. A loose needle will cause noisy reproduction. If undue noise is obtained, therefore, examine the reproducer and make certain that the needle is fastened rigidly by the needle screw.

3. To insure proper operation and long life, the Victrola must be lubricated sufficiently; periodical oiling at six-month intervals is recommended. The bearings for the motor spindle and winding shaft are accessible upon removal of the turntable; all other moving parts can be reached by disassembling the motorboard from the cabinet. To remove the turntable, simply unscrew the spindle cap (using the special key furnished for this purpose). The motorboard may be disengaged upon withdrawing the four corner screws and then detaching the lid support plate. Apply machine oil of good quality on all bearings, also on the governor friction pad and associated friction disc; use light cup grease or vaseline on the motor gears.

SERVICE DATA

This instrument is a small portable type mechanical phonograph built into a cabinet resembling a small suitcase. Excellent quality, high output and good mechanical construction are features of this instrument.

LUBRICATION

Premature wear, noisy operation and failure of parts are direct results of failure to clean and lubricate the motor at necessary intervals. The various bearings and gears of the motor should be cleaned and lubricated at least once every six months. In addition to the regular lubrication, all motor parts should be covered with a light film of oil to prevent rusting. Use only Stock No. 7226 Motor Oil and Stock No. 7227 Motor Grease when lubricating this instrument.

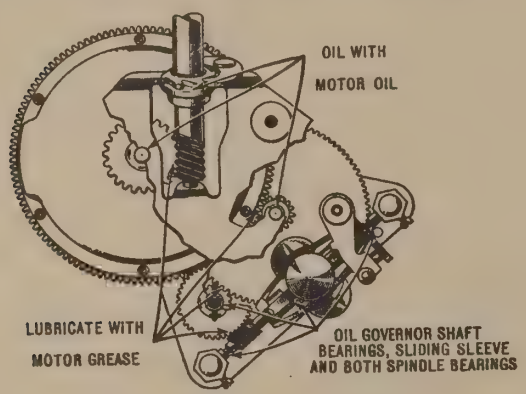


Figure A—Lubrication Diagram

Motor. Figure A shows a view of the motor with the top plate cut away. Before lubricating the parts shown in this illustration, a thorough cleaning with carbon tetrachloride (Carbona) or gasoline is necessary. If necessary disassemble the entire motor for such cleaning.

Tone Arm. The joint between the taper tube and the sound chamber must be free to swing easily without play and be sealed with grease. This bearing is accessible when the three mounting screws are removed. Failure to seal this joint will result in poor quality. Unnecessary friction will cause undue record wear.

MOTOR

The motor used is of simple design and will give excellent performance. If kept clean and properly lubricated, little service attention will be required. The following points may prove useful when it is necessary to effect repairs. *Before doing any work on the motor the machine must be allowed to run down completely.*

Removing Motor from Cabinet. To remove the motor from the cabinet proceed as follows:

(*a*) Unscrew the spindle cap and remove the turntable.

(*b*) Remove the five screws that hold the motor board and lid-support to the cabinet and remove the motor-board assembly.

(*c*) Remove the speed-regulator lever.

(*d*) Remove the three machine screws that hold the motor in place. The motor may then be removed.

Changing Motor Springs. Should a spring break and require replacement the best method to make a repair is to replace the entire spring barrel. While the cost of the spring barrel is greater than that of the spring alone, the saving in labor will usually justify such replacement. Unless the serviceman is experienced in handling springs of this type, the following directions should be followed carefully:

(*a*) Disassemble the motor and remove the spring barrel. Remove the winding gear.

(*b*) Place the gear flat on a piece of metal and file off the ends of the six rivets. Remove the rivets and gear.

(*c*) Place the palm of the right hand over the closed end of the barrel, making sure that the fingers do not protrude beyond the open side. Firmly hold the barrel, open side downward, over a large can or barrel. With the left hand pull the center turns of the spring out. As soon as the spring starts, pull the left hand clear of the can, holding the spring barrel firmly until the spring is entirely clear.

(*d*) *A new coiled spring may prove extremely dangerous if not properly handled. Read these instructions and work very carefully, especially if not experienced in work of this kind.* The new spring is furnished coiled and with a heavy wire clamp holding the spring tightly wound. Pull out about one foot of the spring. Then with the spring flat on a table gently tap the ring until it comes to the edge. Do not push the clamp so close to the edge that it will not hold the spring.

Place the hook end of the spring over the barrel hook. Wind the exposed end into the barrel and then insert the entire spring in the barrel, allowing the clamp to be on the outer edge. Place a block over the entire spring and force the spring into the barrel, thereby releasing the clamp.

(*f*) Place a tablespoonful of spring lubricant between the spring leaves and in the center of the spring.

(*g*) Place the gear in position and rivet it with six rivets to the spring barrel. Use a small punch for flattening the ends of the rivets. Place the gear on a flat surface while re-riveting the barrel to it.

(*h*) Reassemble the motor in the reverse manner of that used to dismantle it.

Winding Shaft Binding. A heavy jar may cause the motor to shift slightly on the motor board and produce binding of the winding shaft against the motor board. Loosening the motor mounting screws and shifting the motor to its proper position (center of slot) will correct this condition.

.0851

REPLACEMENT PARTS

Insist on genuine factory tested parts, which are readily identified and may be purchased from authorized dealers

Stock No.	DESCRIPTION	List Price
2872	Governor ball and spring assembly—Comprising ball, spring mounting screws, and washers—Package of 5	$0.75
2937	Gear—Winding gear and sleeve	.75
2947	Leather—Friction leather for brake—Package of 20	.50
4107	Brake—Turntable brake and bracket	.55
4108	Lever—Speed regulator lever	.45
4109	Cup—Needle cup	.22
4110	Holder—Needle holder	.45
4111	Cap—Turntable spindle cap	.65
4112	Plate—Speed regulator plate	.55
4113	Bracket—Sound box rest bracket	.50
4114	Support—Lid support	.25
4115	Screw and washer—Motor board mounting screw and washer—Package of 3	.25
4116	Catch—Cabinet catch complete with mounting rivets—Package of 2	.40
4117	Strap—Record pocket strap assembly	.16
4118	Screw—Needle holding screw—Package of 10	.65
6837	Key—Winding key	.70
6838	Handle—Carrying handle	.82
6839	Extension—Winding shaft extension	.45
6933	Sound box—Complete with needle screw	1.80
7210	Spindle—Turntable spindle with pins and ball bearing—Less gear	.50
7211	Gear—Turntable spindle gear complete, with set screw	.50
7214	Governor assembly — Comprising governor spindle, disc, sleeve, collar, governor balls and springs	$2.50
7226	RCA Victor motor grease—1 pint can	.40
7227	RCA Victor motor oil—1 pint can	.50
7228	RCA Victor spring lubricant—1 pint can	.65
7719	Board—Motor board with horn—Less hardware and motor—Green	3.90
7720	Arm—Tone arm assembly	3.26
7721	Turntable—Green	1.20
7722	Turntable—Blue	1.20
7723	Board—Motor board and horn—Less hardware and motor—Blue	3.90
7724	Cabinet—Complete with handle and catches—Blue	12.40
7725	Cabinet—Complete with handle and catches—Green	12.70
7726	Pocket—Record pocket—Black	.98
7727	Pocket—Record pocket—Green	.98
7729	Plate—Top plate assembly	3.96
7730	Motor—Motor complete with spindle cap	10.40
8655	Barrel—Spring barrel assembly	2.64
8656	Spring—Mainspring	1.15
8657	Gear—Intermediate gear pinion and shaft	.70
8658	Shaft — Winding shaft — Comprising shaft, collar, pin, ratchet, and washer — Less winding extension	.96
10116	Spring—Brake spring—Package of 10	.60

RCA Victor Company, Inc.

CAMDEN, N. J., U. S. A.

23722
S. O. 761075-49 4M

Printed in U. S. A.

Service Notes
for
RCA Victor Portable Victrola Model 2-25

The RCA Victor Portable Victrola Model 2-25 is a small portable type reproducing instrument built into a metal cabinet resembling a small suitcase. Excellent quality, high output and good mechanical construction are features of this instrument.

LUBRICATION

Premature wear, noisy operation and failure of parts are direct results of failure to clean and lubricate the motor at necessary intervals. The various bearings and gears of the motor should be cleaned and lubricated at least once every six months. In addition to the regular lubrication, all motor parts should be covered with a light film of oil to prevent rusting. Use only RCA Victor Motor Oil and Motor Grease when lubricating this instrument.

Initial Operation. When the instrument is first played, wind the motor and allow it to run down completely several times. This insures a complete distribution of lubricant within the spring barrel. Maximum run is dependent on this point.

The speed of the motor should be adjusted so that the turntable revolves at 78 R. P. M. This can be checked by means of a Stroboscope Disc in conjunction with a source of A. C. illumination of proper frequency for the disc used or by counting the revolutions. In both cases a record must be playing in the normal manner when the check is made.

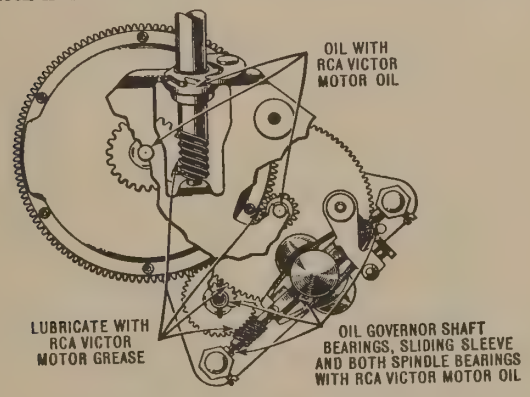

OIL WITH RCA VICTOR MOTOR OIL
LUBRICATE WITH RCA VICTOR MOTOR GREASE
OIL GOVERNOR SHAFT BEARINGS, SLIDING SLEEVE AND BOTH SPINDLE BEARINGS WITH RCA VICTOR MOTOR OIL

Figure 1—Lubrication Diagram of Model 2-25

Motor. Figure 1 shows a view of the motor with the top plate removed. Before lubricating the parts shown in this illustration, a thorough cleaning with carbon tetrachloride (Carbona) or gasoline is necessary. If necessary disassemble the entire motor for such cleaning.

Tone Arm. The joint between the taper tube and the sound chamber must be free to swing easily without play and be sealed with grease. This bearing is accessible when the three mounting screws are removed. Failure to seal this joint will result in poor quality. Unnecessary friction will cause undue record wear.

MOTOR

The motor used in Model 2-25 is of simple design and will give excellent performance. If kept clean and properly lubricated, little service attention will be required. The following points may prove useful when it is necessary to effect repairs. *Before doing any work on the motor the machine must be allowed to run down completely.*

Removing Motor from Cabinet. To remove the motor from the cabinet proceed as follows:

(*a*) Unscrew the spindle cap and remove the turntable.

(*b*) Remove the four machine screws that hold the motor in place. The motor may then be removed through the hole in the motor board.

Changing Motor Springs. Should a spring break and require replacement the best method to make a repair is to replace the entire spring barrel. While the cost of the spring barrel is greater than that of the spring alone, the saving in labor will usually justify such replacement. Unless the serviceman is experienced in handling springs of this type, the following directions should be followed carefully:

(*a*) Disassemble the motor and remove the spring barrel. Remove the winding gear.

(*b*) Place the gear flat on a piece of metal and file off the ends of the six rivets. Remove the rivets and gear.

(*c*) Place the palm of the right hand over the closed end of the barrel, making sure that the fingers do not protrude beyond the open side. Firmly hold the barrel, open side downward over a large can or barrel. With the left hand pull the center turns of the spring out. As soon as the spring starts, pull the left hand clear of the can holding the spring barrel firmly until the spring is entirely clear.

(*d*) A new coiled spring may prove extremely dangerous if not properly handled. Read these instructions and work very carefully especially if not experienced in work of this kind. The new spring is furnished coiled and with a heavy wire clamp holding the spring tightly wound. Pull out about one foot of the spring. Then with the spring flat on a table gently tap the ring until it comes to the edge. Do not push the clamp so close to the edge that it will not hold the spring.

Place the hook end of the spring over the barrel hook. Wind the exposed end into the barrel and then insert the entire spring in the barrel allowing the clamp to be on the outer edge. Place a block over the entire spring and force the spring into the barrel thereby releasing the clamp.

(*f*) Place a tablespoonful of spring lubricant between the spring leaves and in the center of the spring.

(*g*) Place the gear in position and rivet it with six rivets to the spring barrel. Use a small punch for flattening the ends of the rivets. Place the gear on a flat surface while re-riveting the barrel to it.

(*h*) Reassemble the motor in the reverse manner of that used to dismantle it.

Winding Shaft Binding. A heavy jar may cause the motor to shift slightly on the motor board and produce binding of the winding shaft against the motor board. Loosening the motor mounting screws and shifting the motor to its proper position will correct this condition.

REPLACEMENT PARTS

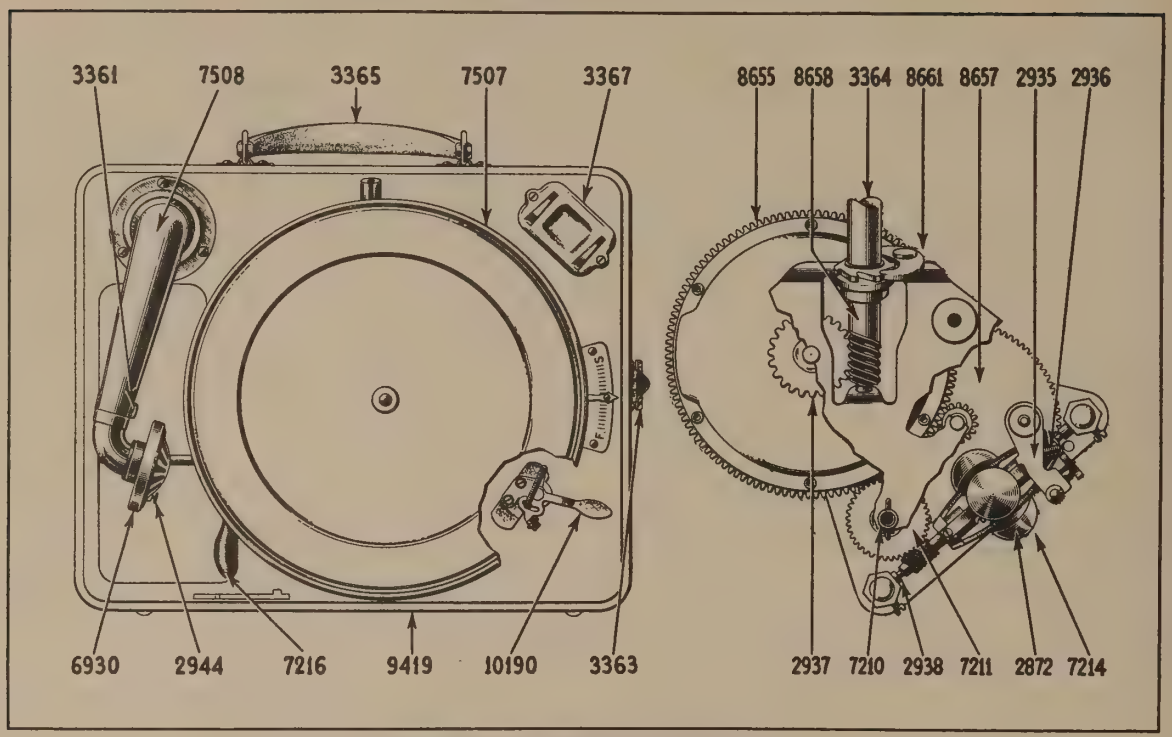


Figure 2—Cabinet, Motor Board and Motor Parts

Stock No.	DESCRIPTION	List Price
2872	Governor ball and spring assembly—Comprising ball, spring, mounting screws and washers—Package of 5	$0.75
2935	Lever—Speed regulator lever complete with stud and spring—Package of 2	.50
2936	Spring—Speed regulator lever spring—Package of 10	.50
2937	Gear—Winding gear and sleeve	.90
2943	Cap—Turntable spindle cap screw—Package of 5	1.50
2944	Screw—Sound box needle screw—Package of 20	1.00
2947	Leather—Friction leather for brake—Package of 20	.50
3361	Hook—Tone arm and crank hook	.65
3362	Hinge—Cabinet hinge with mounting screws—Package of 2	.60
3363	Lock—Lid lock with mounting screws	.90
3364	Extension—Winding shaft extension	.70
3365	Handle—Carrying handle complete with bracket and mounting rivets	.90
3366	Scale—Speed regulator scale complete with mounting screws	.50
3367	Holder—Needle holder	.75
6930	Sound box—Complete with needle screw	4.50
7210	Spindle—Turntable spindle complete with pins and ball bearing—Less gear	.80
7211	Gear—Turntable spindle gear complete with set screw	$0.50
7214	Governor assembly—Comprising governor spindle, disc, collar, governor balls and springs	2.50
7216	Key—Winding key	1.00
7226	RCA Victor motor oil—1 pint can	.50
7227	RCA Victor motor grease—1 pint can	.60
7228	RCA Victor spring lubricant—1 pint can	.65
7447	Plate—Top plate assembly comprising top and bottom plates complete	3.00
7507	Turntable—Complete with covering	2.90
7508	Tube—Taper tube with pivot pin—Less sound box—Used with sound box No. 6930	2.20
8655	Barrel—Spring barrel complete with main spring and driving gear—Less winding gear	3.00
8656	Spring—Main spring	1.15
8657	Gear—Intermediate gear complete with pinion and shaft	.70
8658	Shaft — Winding shaft — Comprising shaft, collar, pin, ratchet and washer —Less winding extension	1.25
8661	Motor—Motor complete with spindle cap	12.00
9419	Cabinet complete—Less mechanism	Price on application
10190	Brake—Turntable hand brake—Package of 2	.50

Service Division RCA Victor Company, Inc., Camden, N. J.

S. O. 9286 5M—6-10-'32

Service Notes
for
RCA Victor Portable Victrola Model 2-65

The RCA Victor Portable Victrola Model 2-65 is a small portable type instrument built into a cabinet resembling a small suitcase. Excellent quality, high output and good mechanical construction are features of this instrument.

LUBRICATION

Premature wear, noisy operation and failure of parts are direct results of failure to clean and lubricate the motor at necessary intervals. The various bearings and gears of the motor should be cleaned and lubricated at least once every six months. In addition to the regular lubrication, all parts should be covered with a light film of oil to prevent rusting. Use only RCA Victor Motor Oil and Motor Grease when lubricating this instrument.

Initial Operation. When the instrument is first played, wind the motor and allow it to run down *completely* several times. This insures a complete distribution of lubricant within the spring barrel. Maximum run is dependent on this point.

The speed of the motor should be adjusted so that the turntable revolves at 78 R.P.M. This can be checked by means of a Stroboscope Disc in conjunction with a source of A.C. illumination of proper frequency for the disc used or by counting the revolutions. In both cases a Record must be playing in the normal manner when the check is made.

Motor. Figure 1 shows a view of the motor with the top plate removed. Before lubricating the parts shown in this illustration, a thorough cleaning with carbon tetra-chloride (Carbona) or gasoline is necessary. If necessary disassemble the entire motor for such cleaning.

Tone Arm. The joint between the goose neck and tone arm and that between the tone arm and sound chamber must be free to swing easily without play and be sealed with grease. The goose neck is detached or adjusted by means of two collars that hold it in place. The bearing between the tone arm and sound box is accessible when the swivel and three mounting screws are removed. Failure to seal these joints will result in poor quality. Unnecessary friction at either of these points will cause undue record wear.

AUTOMATIC STOP MECHANISM

The Automatic Stop Mechanism is simple of design and effective in operation. Figure 2 shows its principal parts.

Failure to Start. Should pulling the tone arm to the right and then placing the sound box on the record fail to start the motor, it may be due to:

(a) Improper location of base plate. Loosen the screws A, B, and C and shift position of mechanism counter-clockwise until proper operation is secured.

(b) Worn or rounded surfaces at point D. Square these points with a small file.

(c) Insufficient tension at spring E. Remove a few turns or replace spring.

Failure to Trip. Should the mechanism fail to stop the motor at the end of a Victor record having the eccentric groove, check the following:

(a) Improperly adjusted base plate. Loosen screws A, B, and C and shift the mechanism clockwise until proper operation is obtained.

(b) Loose or improperly adjusted latch plate.

(c) Insufficient tension at spring F. Remove several turns or replace spring.

Tripping during Operation. Premature tripping during the operation of a record may be caused by:

(a) Binding at bearing G. Clean and lubricate this bearing.

(b) Insufficient bite at point D. Loosen the screws A, B, and C and adjust the base plate so that a larger bite is obtained at point D.

MOTOR

The motor used in Model 2-65 is of simple design and will give excellent performance. If kept clean and properly lubricated, little service attention will be required. The following points may prove useful when it is necessary to effect repairs.

Removing Motor from Cabinet. To remove the motor from the cabinet proceed as follows:

(a) Unscrew the spindle cap and remove the turntable.

(b) Remove the eight machine screws that hold the motor board in place. The sound deflector is also removed.

(c) Remove the three motor mounting screws, together with the one holding the speed regulator lever. Remove this lever. The motor board may now be turned over and the motor pulled clear and placed in a position convenient for work. The various parts are easy of access and adjustments or replacements are simple to make.

Changing Motor Springs. Should a spring break and require replacement the best method to make a repair is to replace the entire spring barrel. While the cost of the spring barrel is greater than that of the spring alone, the saving in labor will usually justify such replacement. Unless the serviceman is experienced in handling springs of this type, the following directions should be followed carefully:

(a) Disassemble the motor and remove the spring barrel. Remove the winding gear.

(b) Place the gear flat on a piece of metal and file off the ends of the six rivets. Remove the rivets and gear.

(c) Place the palm of the right hand over the closed end of the barrel, making sure that the fingers do not protrude beyond the open side. Firmly hold the barrel, open side downward over a large can or barrel. With the left hand pull the

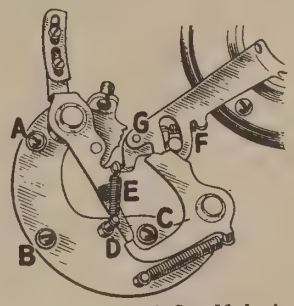


Figure 2—Automatic Stop Mechanism

center turns of the spring out. As soon as the spring starts, pull the left hand clear of the can holding the spring barrel firmly until the spring is entirely clear.

(d) The new spring is furnished coiled and with a heavy wire clamp. Hit the spring flat on a table thereby driving the clamp to one edge of the spring. Grasp the exposed part of the spring firmly with the right hand and pull the clamp off with the left hand. Allow the spring to gradually release its tension in the right hand and then unwind it completely.

(e) Place the hooked end of the spring over the barrel hook and wind the spring into the barrel toward the center. Be careful to push each turn completely inside the barrel before winding on the next turn.

(f) Place a tablespoonful of spring lubricant between the spring leaves and in the center of the spring.

(g) Place the gear in position and rivet it with six rivets to the spring barrel. Use a small punch for flattening the ends of the rivets. Place the gear on a flat surface while re-riveting the barrel to it.

(h) Reassemble the motor in the reverse manner of that used to dismantle it.

Winding Shaft Binding. A heavy jar may cause the motor to shift slightly on the motor board and produce binding of the winding shaft against the motor board. Loosening the motor mounting screws and shifting the motor to its proper position will correct this condition.

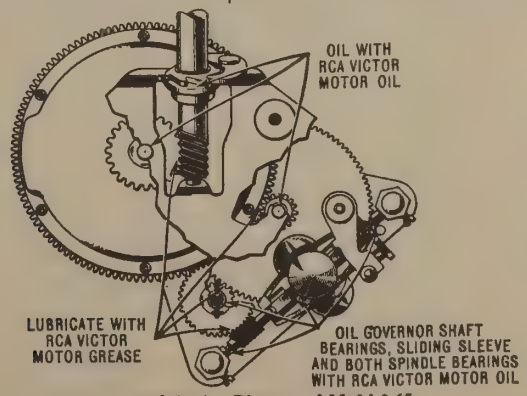

OIL WITH RCA VICTOR MOTOR OIL
LUBRICATE WITH RCA VICTOR MOTOR GREASE
OIL GOVERNOR SHAFT BEARINGS, SLIDING SLEEVE AND BOTH SPINDLE BEARINGS WITH RCA VICTOR MOTOR OIL

Figure 1—Lubrication Diagram of Model 2-65

REPLACEMENT PARTS

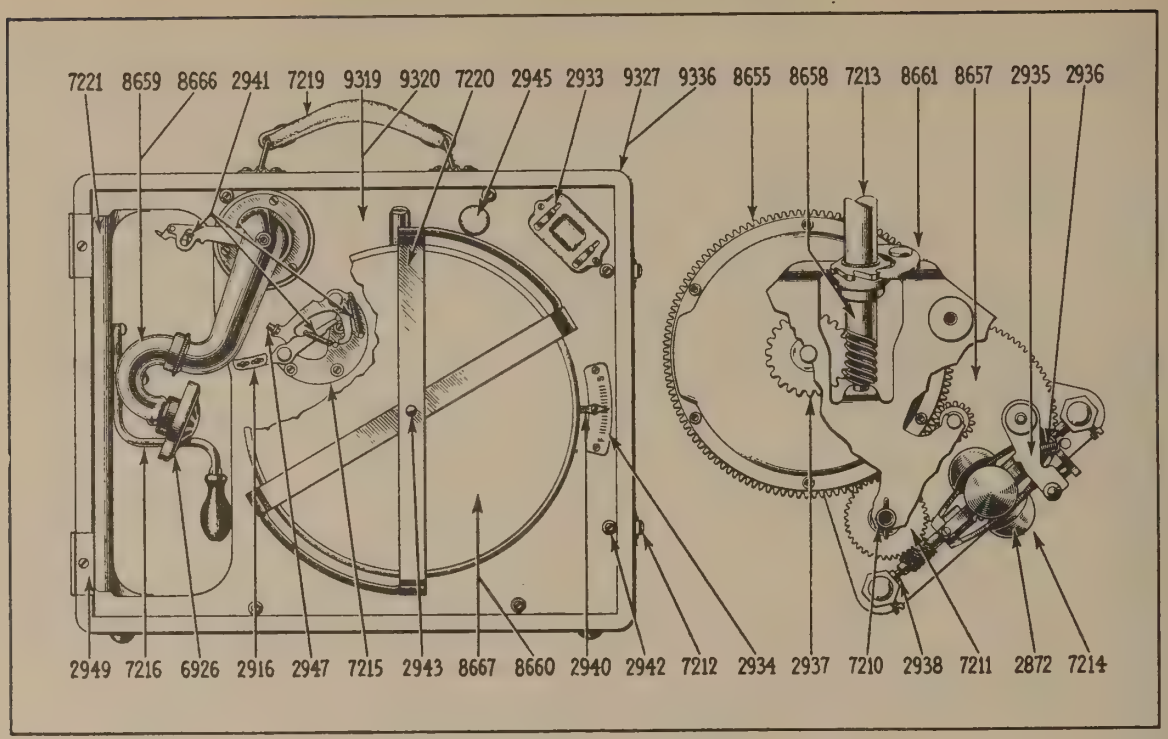


Figure 3—Cabinet, Motor Board and Motor Parts

STOCK NO.	DESCRIPTION	LIST PRICE
2872	Governor Ball and Spring—Governor ball and spring assembly comprising ball, spring, mounting screws and washers—Package of 5	$0.75
2916	Plate—Latch Plate complete with mounting screws—Package of 5	.60
2933	Holder—Needle Holder complete with mounting screw—Package of 2	.80
2935	Lever—Speed Regulator Lever complete with stud and spring—Package of 2	.50
2936	Spring—Speed Regulator Lever Spring—Package of 10	.50
2937	Gear—Winding Gear and sleeve	.90
2938	Governor Bearing Assembly—Governor bearing, comprising 2 bearings, 2 set screws and 2 balls—Package of 3 sets	.50
2939	Screw—Motor Mounting Screw complete with washer—Package of 2 sets—Not illustrated	.50
2940	Lever—Speed Regulator Lever complete with springs, washers and nut—Package of 2	.60
2941	Spring—Automatic Brake Springs—one set of 3 springs	.50
2942	Screws—Motor Board Mounting Screws complete with finishing washers—Package of 10	.60
2943	Cap—Turntable spindle cap screw—Package of 5	1.50
2944	Screw—Sound Box Needle Screw—Package of 20—Not illustrated	1.00
2945	Rest—Rubber Needle Rest—Package of 5	.50
2947	Leather—Friction Leather for Brake—Package of 20	.50
2948	Rivet—Driving Gear Rivet—Package of 100	.50
7210	Spindle—Turntable Spindle complete with Pin and Ball Bearing—less gear	.80
7211	Gear—Turntable Spindle Gear complete with set screw	.50
7212	Catch—Cabinet Catch, two pieces, complete with mounting rivets—Package of 2	1.00
7213	Extension—Winding Shaft Extension	.60
7214	Governor Assembly—Governor Assembly, comprising governor spindle, disc, collar, governor balls and springs	2.50
7215	Brake—Automatic Brake complete with mounting screws	1.25

STOCK NO.	DESCRIPTION	LIST PRICE
7216	Key—Winding Key	$1.00
7219	Handle—Carrying Handle complete with bracket and mounting rivets	1.00
7226	RCA Victor Motor Oil—1 pint can	.50
7227	RCA Victor Motor Grease—1 pint can	.60
7228	RCA Victor Spring Lubricant—1 pint can	.65
8655	Barrel—Spring Barrel complete with mainspring and driving gear—less winding gear	3.00
8656	Spring—Mainspring—Not illustrated	1.15
8657	Gear—Intermediate Gear complete with pinion and shaft	.70
8658	Shaft—Winding Shaft, comprising shaft, collar, pin, ratchet and washer—less winding extension	1.25
	SPECIAL PARTS SUPPLIED ON ORDER ONLY (NOT TO BE STOCKED)	
2934	Scale—Speed Regulator Scale complete with mounting screw—Package of 5	.50
2949	Hinge—One set of 2 hinges complete with mounting screws and rivets	.50
6926	Sound Box—Sound Box complete with needle screw	4.50
7218	Support—Lid Support with mounting screws, package of 2—Not illustrated	.50
7220	Tray—Record Carrying Tray	.75
7221	Deflector—Sound Deflector	1.50
8659	Tube—Taper tube complete with goose neck and mounting screw—less sound box—Blue	7.00
8660	Turntable—Turntable complete with covering—Blue	2.50
8661	Motor—Spring motor complete with spindle cap screw—less mounting screws	12.00
8666	Tube—Taper Tube complete with goose neck and mounting screw—less sound box—Red	7.00
8667	Turntable—Turntable complete with covering—Red	2.50
9319	Board—Motor Board—Blue	5.50
9320	Board—Motor Board—Red	5.50
9327	Cabinet—Cabinet complete with handle and catches—less motor board—Blue	12.50
9336	Cabinet—Cabinet complete with handle and catches—less motor board—Red	12.50

SERVICE NOTES

for

RCA Victor Short Wave Converter SWA-2

Voltage Rating	105–125 Volts and 200–250 Volts
Frequency Rating	50–60 cycles and 25–40 cycles
Power Consumption	20 Watts
Recommended Antenna Length	25–75 feet
Type of Circuit	Super-Heterodyne Converter
Number and Type of Radiotrons	2 UY-224, 1 UY-227
Height	16 inches
Depth	11⅜ inches
Width	13¼ inches
Weight alone	14 lbs.
Weight Packed for Shipment	18 lbs.

RCA Victor Short Wave Converter SWA-2 is a three tube, single control short wave unit designed to convert all short wave signals from 13.8–200 meters to a single frequency so that they may then be amplified by means of the usual broadcast receiver.

One Radiotron UY-224 is used as an R. F. Amplifying stage, one UY-224 as the detector and one UY-227 as the oscillator. Heater current for these Radiotrons is obtained from a small transformer incorporated in the unit. Plate supply is obtained from the broadcasting receiver.

A wafer connector is supplied that may be inserted under the tube socket when a receiver using a UX-280 rectifier and a filter in the negative side of the line is used. Under these conditions—most modern receivers are so designed that this is true—the plate supply to the converter is obtained through the contact on the wafer connector to the UX-280 filament. On receivers where this condition does not exist, but where Pentode output tubes are used, the wafer connector can be used to make connection to the screen grid of the Pentode. On receivers where neither condition exist any connection that gives a filtered D. C. output of from 180 to 260 volts between the contact and ground will be suitable.

When Model SWA-2 is used in conjunction with receivers employing a single Pentode output tube, fluttering may occur unless the following precaution is taken.

> Connect two 10 MFD. capacitors in series with their center point grounded to the SWA-2 chassis. Connect one capacitor to the +230 volt input to the converter and the other to the screen grid of the R. F. Amplifier in the Converter. The two capacitors will effectually prevent fluttering when receivers of this type are used.

Due to the SWA-2 being identical with the converter chassis used in the RO-23, reference to the RO-23 Service Notes should be made for data pertaining to Service work. The schematic diagram, the wiring diagram and the replacement parts are given in the following pages.

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
2747	Cap—Grid contactor cap—Package of 5	$0.50
2977	Knob—Station selector, or Resonator knob—Package of 5	2.50
3058	Resistor—100,000 ohms—Carbon type—1 watt—Package of 5	2.50
3153	Resistor—1500 ohms—Carbon type—1 watt—Package of 5	2.75
3285	Cord—Drive cord—Package of 5	1.00
3286	Spring—Drive cord tension spring—Package of 5	1.40
3288	Socket—UY Radiotron socket—Complete with insulation strip	.50
3289	Contact lug—Complete with mounting rivets—Package of 10	.50
3290	Switch—Antenna—"Off" and "On"—Toggle type—2 used—Complete with mounting nut	1.00
3291	Board—Terminal board with two soldering terminals complete with mounting rivets—Located on switch bracket—Package of 5	.50
3292	Drive shaft with pulley—Package of 5	2.35
3293	Coil—For resistor board assembly	.65
6100	Coil—Coil assembly with mounting eyelet—For switch and bracket assembly	.75
6101	Socket—Dial lamp socket and bracket with mounting rivets	.50
6102	Capacitor—1000 mmfd.—Package of 5	2.50
6103	Resistor—800 ohms—Carbon type—1 watt—Package of 5	2.00
6104	Resistor—80,000 ohms—Carbon type—1 watt—Package of 5	2.00
6105	Resistor—40,000 ohms—Carbon type—3 watt—Package of 5	2.00
6106	Coupling—Switch lever shaft coupling with 2 taper pins—Package of 5	.50
6107	Switch—Toggle type—Power switch	1.00
6108	Binding post—Complete with terminal lug, mounting washer and mounting nut—Package of 5	1.75
6109	Knob—Knob with pointer—Package of 5	$1.75
6110	Dial lamp shield and indicator	.50
6111	Escutcheon—Range switch knob escutcheon—Package of 5	1.80
6112	Cushion—Receiver chassis rubber cushions—Package of 4	.50
6213	Adapter—Wafer adapter—Package of 5	2.00
7062	Capacitor—Adjustable capacitor—15–70 mmfd.	1.00
7298	Capacitor—0.01 mfd.	.80
7406	Capacitor—Double adjustable capacitor—One section 10–70 mmfd.—One section 800–1000 mmfd.	1.10
7407	Coil—High frequency detector coil	1.05
7408	Coil—Low frequency detector and oscillator coil	1.45
7409	Coil—High frequency oscillator coil	1.85
7410	Capacitor—Variable capacitor—7 plate—Complete with mounting nut and washers	1.75
8806	Transformer—Filament power transformer	3.25
8807	Transformer—Filament power transformer—110 volts–25 cycle	5.75
8808	Transformer—Filament power transformer—220 volts—60 cycle	3.40
8809	Board—Resistor board less resistors, capacitors and coil	1.00
8810	Lever—Switch lever assembly—Comprising shaft, 3 switch levers and coupling bushing	.70
8811	Switch—Range switch complete with mounting washer and nut	6.60
8812	Capacitor—Variable tuning capacitor assembly	5.10
8813	Dial drum and scale	1.20
10820	Capacitor—100 mmfd.	.50
	CABINET	
3229	Escutcheon—Tuning dial escutcheon with mounting screws	.70
6113	Foot—Cabinet felt foot—Package of 15	.50
9399	Cabinet—Complete less equipment	12.00

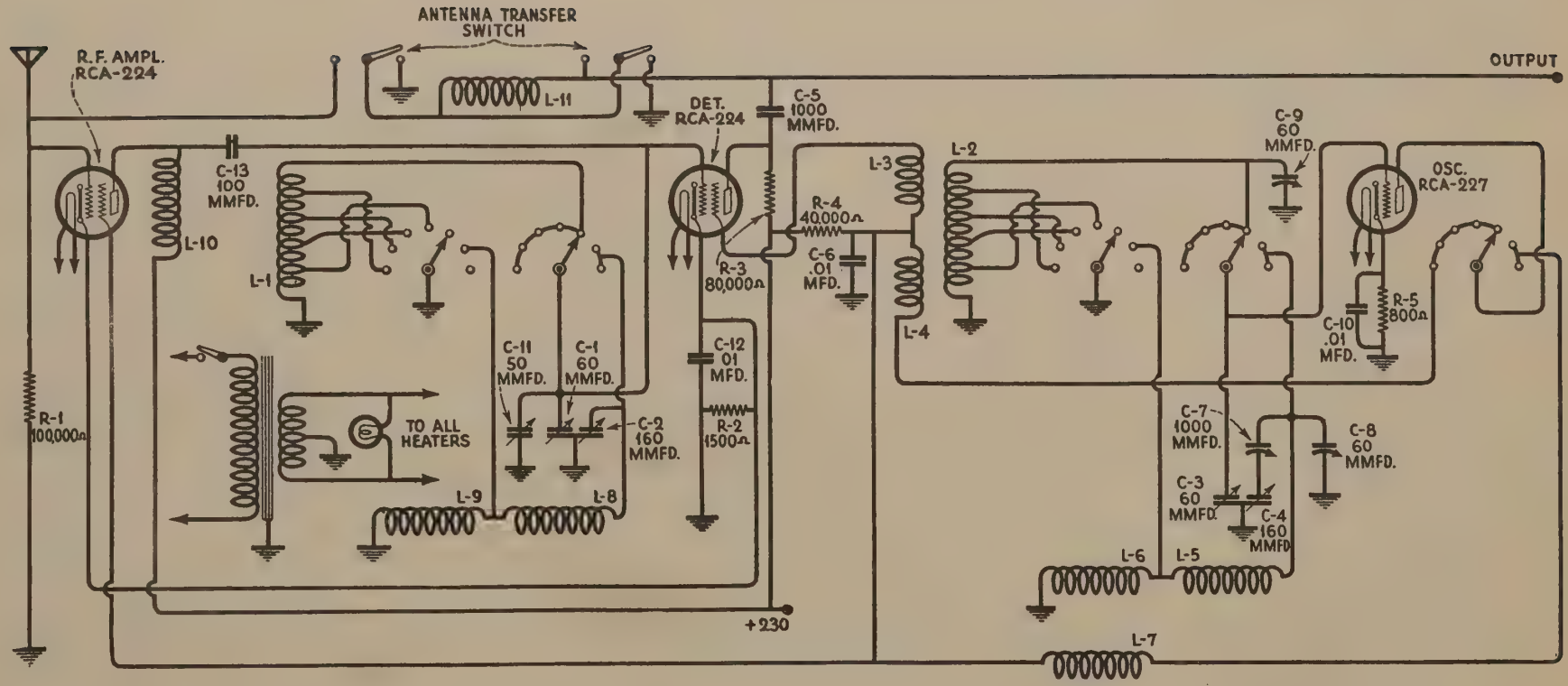


Figure 1—Schematic Circuit

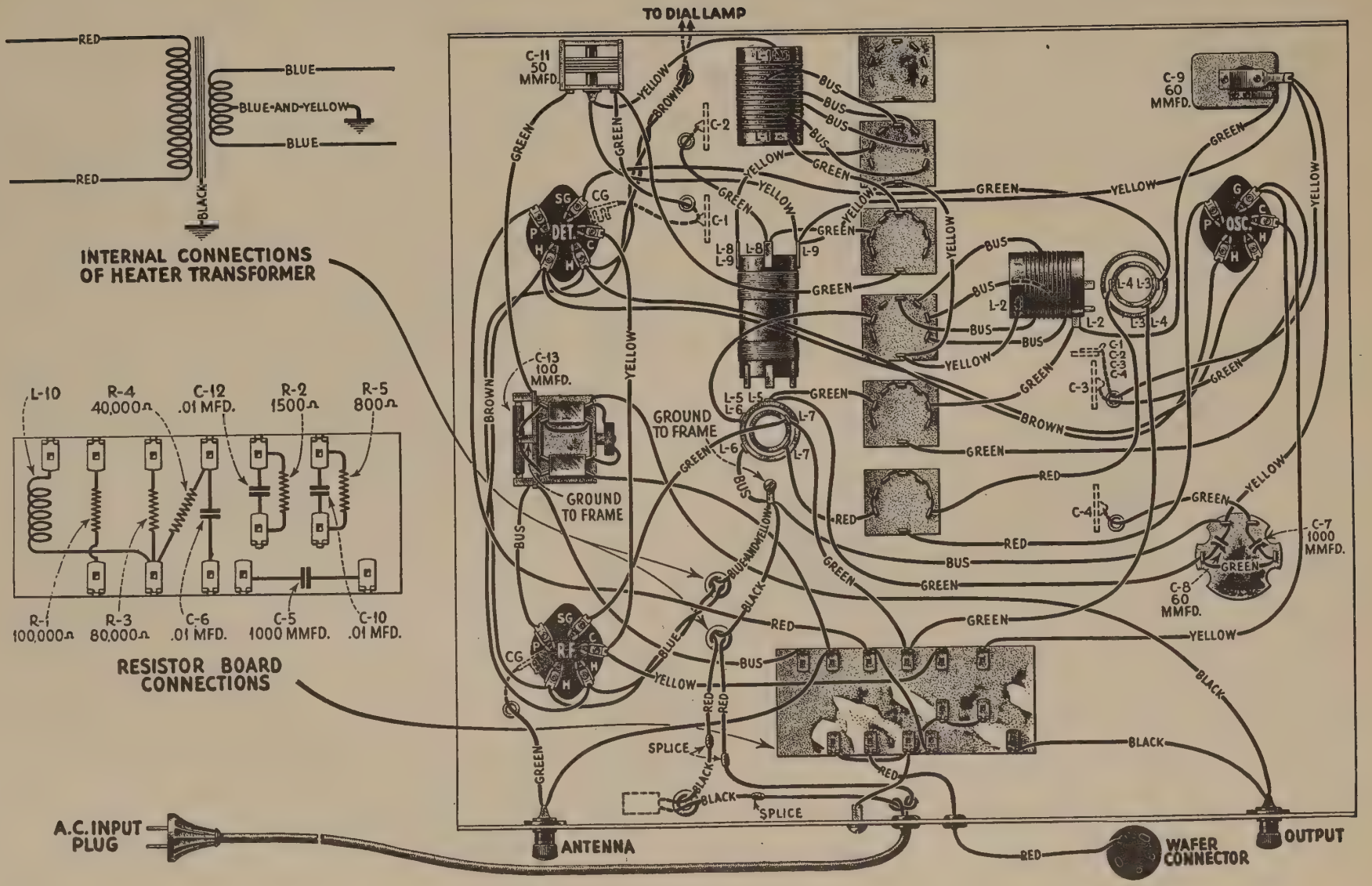


Figure 2—Wiring Diagram

SERVICE DIVISION

RCA Victor Company, Inc.

Camden, N. J., U. S. A.

S. O. 8954 15C 3-2-'32

SERVICE NOTES
for
RCA Victor Models R-4 and R-6

ELECTRICAL SPECIFICATIONS

Voltage Rating ..... 105–125 Volts
Frequency Rating ..... 50–60 cycles and 25–60 cycles
Power Consumption ..... 95 Watts
Type of Circuit ..... Super-Heterodyne
Type and number of Radiotrons ..... 2 RCA-235, 2 UY-227, 1 UY-224, 1 RCA-247 and 1 UX-280
Number of R.F. Stages ..... One
Number of I.F. Stages ..... One using one tuned input transformer and one untuned output transformer
Type of Second Detector ..... Power self biasing
Type of Tone Control ..... Variable resistance in series with condenser that tunes secondary of interstage transformer at "low" position
Number of Audio Stages ..... One—Single Pentode
Type of Rectifier ..... Full wave, UX-280
Undistorted output ..... 2.25 Watts

PHYSICAL SPECIFICATIONS—R-4

Height ..... 17 inches
Depth ..... 10 inches
Width ..... 14 inches
Weight alone ..... 30½ lbs.
Weight Packed for Shipment ..... 36 lbs.

PHYSICAL SPECIFICATIONS—R-6

Height ..... 38½ inches
Depth ..... 11½ inches
Width ..... 23 inches
Weight alone ..... 56 lbs.
Weight Packed for Shipment ..... 77 lbs.

The RCA Victor Models R-4 and R-6 are seven tube Super-Heterodyne radio receivers incorporating such features as Super Control Screen Grid Radiotrons in the R.F. and I.F. stages, single Pentode output stage and the inherent sensitivity, selectivity and tone quality of the RCA Victor Super-Heterodyne. Model R-4 is a table model and R-6 is a small console. Except for the cabinet, speakers and output circuit, both models are identical.

Service work in conjunction with this receiver will be very similar to that of other table type receivers. However, there are several new features of this model which require some consideration.

The second I.F. transformer in this receiver is of the untuned variety, making the set slightly less sensitive and selective than the R-7. This decreased selectivity permits the omission of the 600 K.C. adjustable capacitor used on the R-7, R-10 and other Super-Heterodyne receivers. When aligning adjustments are necessary, it is therefore only necessary to tune one I.F. transformer and the three tuning capacitors. The I.F. transformer is adjusted at 175 K.C. and the tuning capacitors at 1400 K.C. In the case of the latter, the dial should be set at 1400 as well as the oscillator and the three screws adjusted for maximum output. This will permit the dial to read very accurately.

The schematic diagram, the wiring diagram, the voltage readings and the replacement parts are given in the following pages.

RADIOTRON SOCKET VOLTAGES

120 Volt A. C. Line

	VOLUME CONTROL AT MINIMUM							VOLUME CONTROL AT MAXIMUM						
Radiotron No.	Cathode to Heater Volts, D.C.	Cathode or Filament to Control Grid Volts, D. C.	Cathode or Filament to Screen Grid Volts, D. C.	Cathode or Filament to Plate Volts, D. C.	Plate Current M. A.	Screen Current M. A.	Heater or Filament Volts, A. C.	Radiotron No.	Cathode to Heater Volts, D. C.	Cathode or Filament to Control Grid Volts, D. C.	Cathode or Filament to Screen Grid Volts, D. C.	Cathode or Filament to Plate Volts, D. C.	Plate Current M. A.	Screen Current M. A.	Heater or Filament Volts, A. C.
1. R. F.	50	50	60	235	0	0	2.66	1. R. F.	3.0	3.0	65	260	3.0	0.5	2.66
2. Osc.	50	0	—	55	4.5	—	2.66	2. Osc.	3.0	0	—	60	5.0	—	2.66
3. 1st Det.	10	9	100	260	1.0	0.25	2.66	3. 1st Det.	6.0	5.5	60	260	0.75	0.25	2.66
4. I. F.	50	50	60	235	0	0	2.66	4. I. F.	3.0	3.0	65	260	3.0	0.5	2.66
5. 2d Det.	25	10	—	250	1.0	—	2.66	5. 2d Det.	25	10.0	—	250	1.0	—	2.66
6. Pwr.	—	10	290	280	35	—	2.66	6. Pwr.	—	10.0	290	280	35	—	2.66

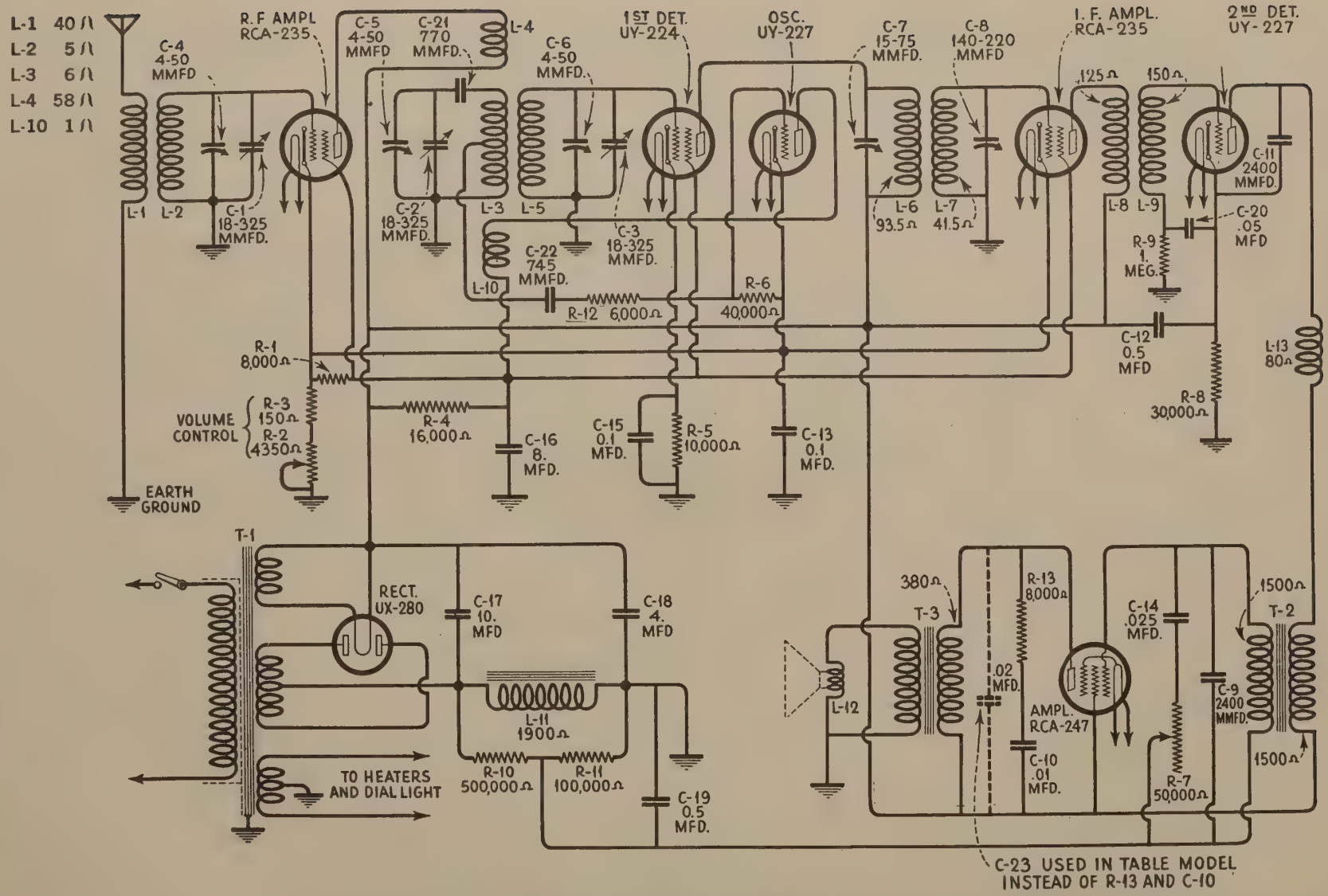


Figure 1—Schematic Wiring Diagram

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
	PARTS COMMON TO R-4 AND R-6	
2563	Resistor—6000 ohms—Carbon type—1 watt—Package of 5	$3.00
2746	Socket—Dial lamp socket	.50
2747	Cap—Grid contactor cap—Package of 5	.50
2749	Capacitor—2400 mmfd.	1.50
2875	Knob—Tuning control, volume control or tone control knob—Package of 5	1.50
2881	Bracket—Dial lamp bracket—Package of 5	.50
2882	Socket—Five contact Radiotron socket—Complete with insulator—6 used	.50
2963	Resistor—8000 ohms—Carbon type—1 watt—Package of 5	2.50
2968	Socket—Four contact Radiotron socket—Complete with insulator—1 used	.50
2991	Transformer—1st intermediate transformer	3.00
2994	Coil—R.F. choke coil	.60
2995	Volume control—Volume control complete with mounting nut—Package of 5	6.00
2997	Coil—R.F. coil	1.90
2999	Shaft—Tuning condenser drive shaft complete	.50
3000	Scale—Dial drum and scale with set screws	.60
3003	Cushion—Receiver chassis sponge rubber cushion—Package of 4	.50
3048	Resistor—500,000 ohms—Carbon type—½ watt—Package of 5	2.50
3056	Shield—Radiotron shield—3 used—Package of 2	.50
3060	Resistor—40,000 ohms—Carbon type—1 watt—Package of 5	2.50
3076	Resistor—1 megohm—Carbon type—½ watt—Package of 5	2.50
3077	Resistor—30,000 ohms—Carbon type—½ watt—Package of 5	2.50
3078	Resistor—10,000 ohms—Carbon type—½ watt—Package of 5	2.50
3081	Resistor—16,000 ohms—Carbon type—3 watt	.60
3082	Board—Resistor board complete—Less resistors, capacitors and coil	1.00
3234	Tone control—Tone control complete with mounting nut	1.90
3252	Resistor—100,000 ohms—Carbon type—½ watt—Package of 5	2.75
6179	Terminal—Single ground terminal—Complete with mounting rivet—Package of 5	.50
6180	Capacitor—0.025 mfd.—Package of 5	.75
6181	Capacitor—770 mmfd.—Package of 5	1.30
6193	Rubber strip—Rubber clamping strip located inside of chassis shield—Package of 4	.50
7054	Cord—Power cord	1.00
7241	Capacitor—3 gang tuning capacitor	8.00
7299	Capacitor—745 mfd.	.70
7436	Coil—1st detector and oscillator coil	3.20
8837	Support—Receiver chassis metal mounting support—Package of 4	.70
8841	Transformer—2d intermediate transformer	2.50
8842	Transformer—Power transformer—105–125 volts, 50–60 cycles	6.25
8843	Transformer—Power transformer—105–125 volts, 25–40 cycles	9.55
8844	Transformer—Power transformer—220 volts, 60 cycles	6.45
	RECEIVER PARTS SPECIAL FOR R-4	
8839	Capacitor—Comprising one 0.05 mfd., two 0.5 mfd., one 10.0 mfd., one 8.0 mfd., one 0.02 mfd., one 4.0 mfd., and two 0.1 mfd. capacitors in metal container	$8.95
8840	Transformer—Audio transformer assembly—Comprising interstage and output transformer	4.50
	RECEIVER PARTS SPECIAL FOR R-6	
6183	Resistor—8,000 ohms—Carbon type—½ watt—Package of 5	2.00
7343	Transformer—Audio transformer assembly—Comprising interstage and output transformer	3.85
8846	Capacitor—Comprising one 0.05 mfd., two 0.5 mfd., one 10.0 mfd., one 8.0 mfd., one 0.01 mfd., one 4.0 mfd. and two 0.1 mfd. capacitors in metal container	8.95
	R-4 LOUDSPEAKER PARTS	
2975	Rivet—Cone retaining ring mounting rivet—Package of 100	.50
3005	Screw assembly—Speaker mounting screw assembly—Comprising 4 screws, 4 eyelets, 4 washers and 4 nuts—Package of 1 set	.50
6182	Board—Terminal board complete with 3 terminals Package of 5	.50
7442	Cone—Speaker paper cone—Package of 5	7.50
8702	Ring—Cone retaining ring	.80
8845	Coil assembly—Speaker field coil assembly—Comprising field coil, cone bracket and magnet	4.50
	R-6 LOUDSPEAKER PARTS	
3237	Screw assembly—Speaker mounting screw assembly—Comprising 4 screws, 4 washers, 4 eyelets and 4 nuts—Package of 1 set	.50
6184	Board—Terminal board complete with 3 terminals and mounting rivets—Package of 5	.50
7345	Coil—Speaker field coil assembly—Comprising coil, cone housing and magnet	5.00
8559	Ring—Cone retaining ring	.80
8601	Cone—Speaker paper cone—Package of 5	15.00
	R-4 CABINET PARTS	
X-33	Baffle board and grille cloth	.85
6113	Foot—Felt foot—Package of 15	.50
7437	Escutcheon—Tuning dial escutcheon—Complete with mounting screws	.90
9403	Cabinet—Cabinet complete less equipment	13.00
	R-6 CABINET PARTS	
X-34	Post—Front post—R.H.	2.85
X-35	Post—Back post—R.H.	2.55
X-36	Post—Front post—L.H.	2.85
X-37	Post—Back post—L.H.	2.55
X-38	Control panel	4.60
X-39	Moulding—Control panel top moulding	1.60
X-40	Top	4.85
X-41	Stretcher	3.55
X-42	Foot	1.10
X-43	Baffle board with grille cloth	.90
7437	Escutcheon—Tuning dial escutcheon—Complete with mounting screws	.90
9404	Cabinet—Cabinet complete less equipment	42.35

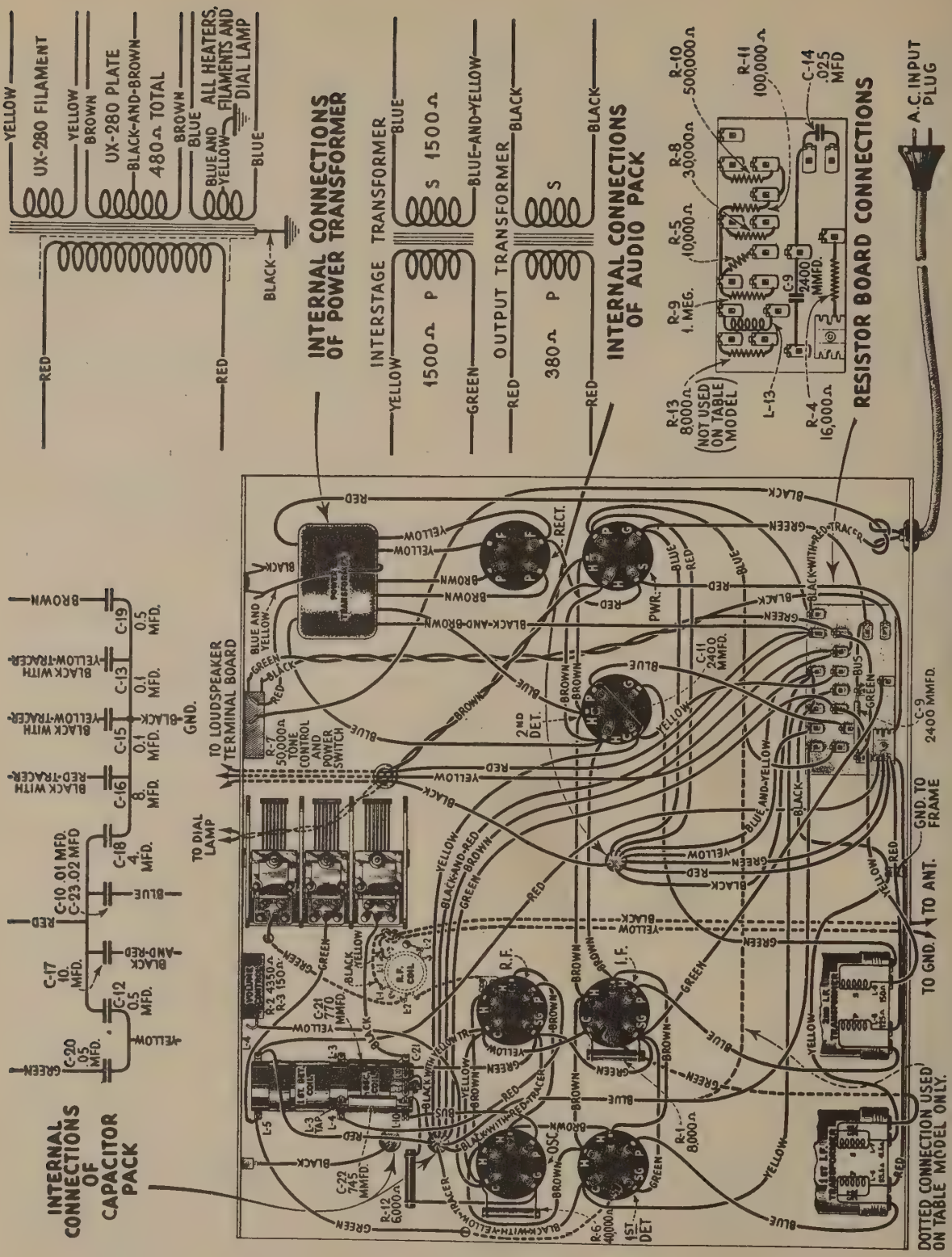


Figure 2—Wiring Diagram

SERVICE DIVISION

RCA Victor Company, Inc.

Camden, N. J., U. S. A.

8731 20M—1-14-'32

SERVICE NOTES

for

RCA Victor Radiolette R-5

The RCA Victor Radiolette R-5 is a two tuned circuit R.F. type radio receiver. Compact construction together with good sensitivity, selectivity and high output are features of this receiver.

The receiver uses four Radiotrons, two UY-224, one UX-280, and one RCA-247 Power Output Pentode. Referring to Figure 1 and tracing a signal through the various stages we find the following action taking place.

The antenna and ground are connected to each side of a 20,000 Ohm potentiometer. The moving contact of the potentiometer is connected to the primary of the first R.F. transformer through a .00013 MFD. condenser, the other side of the transformer being connected to ground. The action of the potentiometer, reducing the voltage applied to the grid of the first R.F. tube, constitutes that of a volume control. The secondary of the R.F. transformer is connected to the grid circuit of the R.F. Radiotron UY-224, which is tuned by one unit of the gang condenser. The plate circuit of this tube works into the primary coil of the 2nd R.F. transformer.

The detector is of the regenerative, grid bias type and its output is coupled by means of resistance coupling to the output Radiotron RCA-247. The regenerative feature of the detector is unusual in that it uses two regeneration coils. One of these resonates at a low frequency and improves the sensitivity at that end, while the other has but few turns and brings up the sensitivity at the high frequency end.

The output stage uses the RCA-247 Output Pentode which gives a high undistorted output—2.5 watts—together with a high gain in the stage.

The grid bias for this tube is obtained by using a portion of the drop across the reproducer field. Due to the fact that the plate current of the RCA-247 represents the greatest portion of the total plate current, using the drop across the field acts as a semi-self biasing arrangement.

Plate and grid supply to all tubes is supplied through the use of Radiotron UX-280. The filter is of the "brute force" type. The reproducer unit field coil functions as the reactor. One electrolytic 10 MFD. capacitor and one paper 2 MFD. capacitor act as filter capacitors.

LINE-UP CAPACITOR ADJUSTMENTS

Two adjustable capacitors are provided for aligning the two tuned circuits at the high frequency end of the scale. The following procedure may be used for making any readjustments that may be necessary.

A. Procure an Oscillator giving a modulated signal at exactly 1400 K.C. Also procure a special socket wrench such as RCA Victor Stock No. 3007.

B. An output indicator is necessary. This may be a current squared thermo-galvanometer connected to the secondary of the output transformer in place of the cone coil or other types of output indicators.

C. Turn the station selector until the knob reads exactly 0. Then remove the chassis from the cabinet being careful not to disturb the setting of the dial. The gang condenser rotor plates should be fully meshed with the stator plates. If not, then the dial drum must be adjusted until such a condition exists. Replace the chassis in the cabinet.

D. Place the oscillator in operation at exactly 1400 K.C. and couple its output to the antenna lead. Set the dial scale at 85 and place the Radiolette in operation. Place a soft pad on the bench and turn the instrument on its side. Now with the special wrench, adjust each line-up capacitor until maximum output is obtained in the output meter. Be careful to adjust the volume control or oscillator output so that an excessive reading is not obtained. Go over each adjustment a second time to compensate for any interlocking of adjustments.

REPLACEMENT PARTS

Part No.	DESCRIPTION	List Price
2549	Resistor—250,000 Ohms—Carbon type—Package of 5	$3.00
2747	Cap—Control grid contactor cap—Package of 5	.50
2954	Capacitor—By-pass capacitor pack containing three 0.1 Mfd. capacitors	.75
2955	Transformer—First R.F. transformer complete with mounting washer and nut	1.50
2956	Transformer—Second R.F. transformer complete with mounting washer and nut	2.00
2957	Capacitor—10 Mfd. electrolytic type—Complete with terminal, insulating washer, mounting nut and lock washer	3.00
2958	Switch—Operating switch complete with mounting washers and nut	.60
2959	Volume control—20,000 Ohm Volume control complete with mounting washers and nut	1.50
2960	Dial—Dial scale complete with set screws—Package of 2	.50
2961	Coil—Detector plate R.F. choke coil	.50
2962	Capacitor—0.005 Mfd. audio coupling capacitor	.75
2963	Resistor—8000 Ohms—Carbon type—Package of 5	2.50
2964	Resistor—13000 Ohms—Carbon type—Package of 5	2.50
2965	Resistor—600 Ohms—Carbon type—Package of 5	2.50
2966	Resistor—28,000 Ohms—Carbon type—Package of 5	2.50
2967	Resistor—45,000 Ohms—Carbon type—Package of 5	2.50
2969	Resistor—50,000 Ohms—Carbon type—Package of 5	2.50
2970	Resistor—500,000 Ohms—Carbon type—Package of 5	2.50
2971	Resistor—280,000 Ohms—Carbon type—Package of 5	2.50
2972	Shield—Radiotron shield complete with mounting screw, washer and nut	.50
2975	Rivet—Eyelet rivet for mounting cone—Package of 100	.50
2976	Knob—Volume control or operating switch knob—Package of 5	1.50
2977	Knob—Station selector knob—Package of 5	2.50
2978	Screw assembly—Loudspeaker mounting screw assembly comprising four screws, four washers, four lock washers, eight nuts and four eyelets	.60
2981	Capacitor—320 Mmfd. detector plate R.F. by-pass capacitor	.50
3006	Capacitor—.001 Mfd.—Used across low frequency tickler coil	$0.50
3007	Wrench—Special wrench for R.F. line-up condenser adjustments	1.00
5817	Resistor—20,000 Ohms—Carbon type	.90
7054	Cord—Power cord complete with male connector plug	1.00
7229	Socket—Five prong Radiotron socket complete with insulating shield—3 used—Package of 2	.50
7230	Socket—Four prong Radiotron socket complete with insulating shield—1 used—Package of 2	.50
7231	Capacitor—Filter and by-pass capacitor pack—Comprising one 0.05 mfd., two 0.5 mfd., two 0.25 mfd. and one 2.0 mfd. condensers	2.50
7232	Capacitor—2 gang variable tuning capacitor	5.00
7234	Transformer—Output transformer—With fibre terminal board	1.50
7236	Cone—Reproducer cone complete with voice coil and paper ring	1.50
8669	Transformer—Power transformer—105–125 volt, 50–60 cycle—Complete with mounting washers and nuts	6.00
8670	Transformer—Power transformer—105–125 volt, 25–40 cycle—Complete with mounting washers and nuts	9.00
8671	Transformer—Power transformer—220 volts, 50–60 cycles—Complete with mounting washers and nuts	8.00
10434	Resistor—Mid-tapped filament resistor—Used on early models only	.50
	SPECIAL PARTS SUPPLIED ON ORDER ONLY (Not to be stocked)	
2979	Board—Baffle board complete with grille cloth	.75
2980	Escutcheon—Station selector escutcheon complete with mounting screws	.75
7233	Board—Resistor mounting board—Less all resistors, capacitors and coils	1.00
7235	Coil—Field coil complete with bracket and cone ring	2.00
9321	Cabinet—Cabinet complete—Less all equipment	7.25
9339	Chassis—Receiver chassis complete—Less reproducer unit, knobs and Radiotrons	27.50
9340	Reproducer unit—Reproducer unit complete	4.75

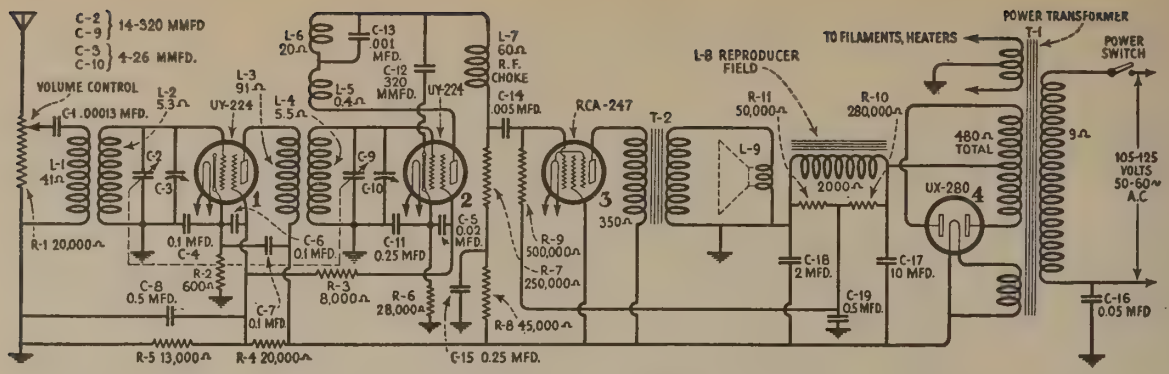


Figure 1—Schematic Circuit Diagram of Model R-5

SOCKET VOLTAGE READINGS

110-VOLT LINE

These are readings obtained with the usual Set Analyzers and are not true readings of the voltages at which the Radiotrons operate.

Radiotron No.	Heater to Cathode Volts	Cathode or Filament to Control Grid Volts	Cathode or Filament to Screen Grid Volts	Cathode or Filament to Plate Volts	Plate Current M. A.	Heater Volts
1	3.0	3.0	85	225	4.0	2.2
2	7.0	7.0	65	100	0.25	2.2
3	———	2.0	225	215	30.0	2.2

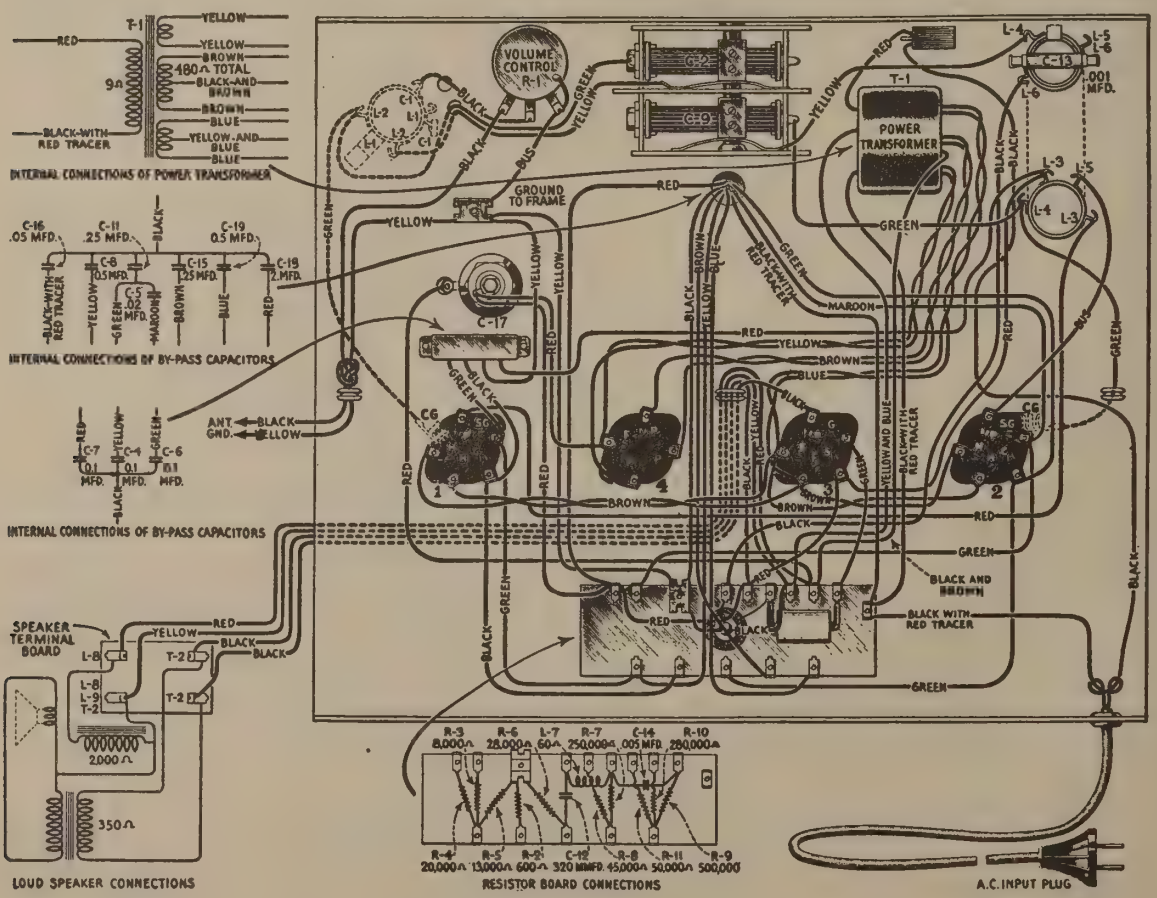


Figure 2—Wiring diagram of Model R-5

SERVICE NOTES

for

RCA Victor Radiolette R-5-X

The RCA Victor Radiolette R-5-X is a two tuned circuit R. F. type radio receiver. Compact construction together with good sensitivity, selectivity and high output are features of this receiver.

The receiver uses four Radiotrons, two UY-224, one UX-280, and one RCA-247 Power Output Pentode. Referring to Figure 1 and tracing a signal through the various stages we find the following action taking place.

The antenna and ground are connected to each side of a 20,000 Ohm potentiometer. The moving contact of the potentiometer is connected to the primary of the first R.F. transformer through a .00013 MFD. condenser, the other side of the transformer being connected to ground. The action of the potentiometer, reducing the voltage applied to the grid of the first R.F. tube, constitutes that of a volume control. The secondary of the R.F. transformer is connected to the grid circuit of the R.F. Radiotron UY-224, which is tuned by one unit of the gang condenser. The plate circuit of this tube works into the primary coil of the 2nd R.F. transformer.

The detector is of the regenerative, grid bias type and its output is coupled by means of resistance coupling to the output Radiotron RCA-247. The regenerative feature of the detector is unusual in that it uses two regeneration coils. One of these resonates at a low frequency and improves the sensitivity at that end, while the other has but few turns and brings up the sensitivity at the high frequency end.

The output stage uses the RCA-247 Output Pentode which gives a high undistorted output—2.5 watts—together with a high gain in the stage.

The grid bias for this tube is obtained by using a portion of the drop across the reproducer field. Due to the fact that the plate current of the RCA-247 represents the greatest portion of the total plate current, using the drop across the field acts as a semi-self biasing arrangement.

Plate and grid supply to all tubes is supplied through the use of Radiotron UX-280. The filter is of the "brute force" type. The reproducer unit field coil functions as the reactor. One electrolytic 10 MFD. capacitor and one paper 2 MFD. capacitor act as filter capacitors.

LINE-UP CAPACITOR ADJUSTMENTS

Two adjustable capacitors are provided for aligning the two tuned circuits at the high frequency end of the scale. The following procedure may be used for making any readjustments that may be necessary.

A. Procure an Oscillator giving a modulated signal at exactly 1400 K.C. Also procure a special socket wrench such as RCA Victor Stock No. 3007.

B. An output indicator is necessary. This may be a current squared thermo-galvanometer connected to the secondary of the output transformer in place of the cone coil or other types of output indicators.

C. Turn the station selector until the knob reads exactly 0. Then remove the chassis from the cabinet being careful not to disturb the setting of the dial. The gang condenser rotor plates should be fully meshed with the stator plates. If not, then the dial drum must be adjusted until such a condition exists. Replace the chassis in the cabinet.

D. Place the oscillator in operation at exactly 1400 K.C. and couple its output to the antenna lead. Set the dial scale at 85 and place the Radiolette in operation. Place a soft pad on the bench and turn the instrument on its side. Now with the special wrench, adjust each line-up capacitor until maximum output is obtained in the output meter. Be careful to adjust the volume control or oscillator output so that an excessive reading is not obtained. Go over each adjustment a second time to compensate for any interlocking of adjustments.

REPLACEMENT PARTS

Part No.	DESCRIPTION	List Price
2549	Resistor—250,000 Ohms—Carbon type—Package of 5.	$3.00
2747	Cap—Control grid contactor cap—Package of 5.	.50
2954	Capacitor—By-pass capacitor pack containing three 0.1 Mfd. capacitors.	.75
2955	Transformer—First R.F. transformer complete with mounting washer and nut.	1.50
2956	Transformer—Second R.F. transformer complete with mounting washer and nut.	2.00
2957	Capacitor—10 Mfd. electrolytic type—Complete with terminal, insulating washer, mounting nut and lock washer.	3.00
3069	Switch—Operating switch complete.	.60
2959	Volume control—20,000 Ohm Volume control complete with mounting washers and nut.	1.50
2960	Dial—Dial scale complete with set screws—Package of 2	.50
2961	Coil—Detector plate R.F. choke coil.	.50
2962	Capacitor—0.005 Mfd. audio coupling capacitor.	.75
2963	Resistor—8000 Ohms—Carbon type—Package of 5.	2.50
2964	Resistor—13000 Ohms—Carbon type—Package of 5.	2.50
2965	Resistor—600 Ohms—Carbon type—Package of 5.	2.50
2967	Resistor—45,000 Ohms—Carbon type—Package of 5.	2.50
2969	Resistor—50,000 Ohms—Carbon type—Package of 5.	2.50
2970	Resistor—500,000 Ohms—Carbon type—Package of 5.	2.50
2971	Resistor—280,000 Ohms—Carbon type—Package of 5.	2.50
2972	Shield—Radiotron shield complete with mounting screw, washer and nut.	.50
2975	Rivet—Eyelet rivet for mounting cone—Package of 100.	.50
2976	Knob—Volume control or Regeneration control knob—Package of 5.	1.50
2977	Knob—Station selector knob—Package of 5.	2.50
2978	Screw assembly—Loudspeaker mounting screw assembly comprising four screws, four washers, four lock washers, eight nuts and four eyelets.	.60
2981	Capacitor—320 Mmfd. detector plate R.F. by-pass capacitor.	.50
3006	Capacitor—.001 Mfd.—Used across low frequency tickler coil.	.50
3007	Wrench—Special wrench for R.F. line-up condenser adjustments.	1.00
3066	Resistor—12,000 Ohms—Carbon type—Package of 5.	$2.50
3067	Variable Resistor — Regeneration Control Variable Resistor complete with mounting washer and nut.	1.50
5817	Resistor—20,000 Ohms—Carbon type.	.90
7054	Cord—Power cord complete with male connector plug	1.00
7229	Socket—Five prong Radiotron socket complete with insulating shield—3 used—Package of 2.	.50
7230	Socket—Four prong Radiotron socket complete with insulating shield—1 used—Package of 2.	.50
7231	Capacitor—Filter and by-pass capacitor pack—Comprising one 0.05 mfd., two 0.5 mfd., two 0.25 mfd. and one 2.0 mfd. condensers.	2.50
7232	Capacitor—2 gang variable tuning capacitor.	5.00
7234	Transformer—Output transformer—With fibre terminal board.	1.50
7236	Cone—Reproducer cone complete with voice coil and paper ring.	1.50
8669	Transformer—Power transformer—105–125 volt, 50–60 cycle—Complete with mounting washers and nuts.	6.00
8670	Transformer—Power transformer—105–125 volt, 25–40 cycle—Complete with mounting washers and nuts.	9.00
8671	Transformer—Power transformer—220 volts, 50–60 cycles—Complete with mounting washers and nuts.	8.00
10434	Resistor—Mid-tapped filament resistor—Used on early models only.	.50
	SPECIAL PARTS SUPPLIED ON ORDER ONLY (Not to be stocked)	
2979	Board—Baffle board complete with grille cloth.	.75
2980	Escutcheon—Station selector escutcheon complete with mounting screws.	.75
3068	Board—Resistor mounting board—Less all resistors, capacitors and coils.	1.00
7235	Coil—Field coil complete with bracket and cone ring.	2.00
9321	Cabinet—Cabinet complete—Less all equipment.	7.25
9339	Chassis—Receiver chassis complete—Less reproducer unit, knobs and Radiotrons.	27.50
9340	Reproducer unit—Reproducer unit complete.	4.75

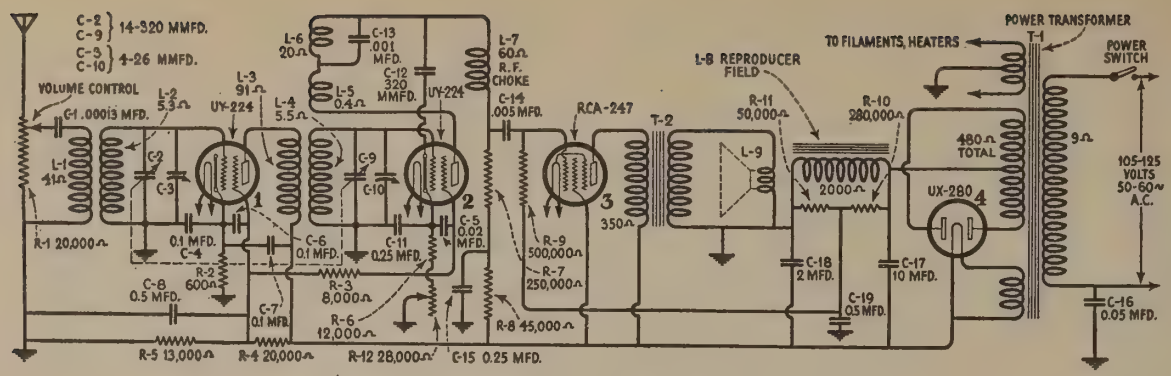


Figure 1—Schematic Circuit Diagram of Model R-5-X

SOCKET VOLTAGE READINGS

110-VOLT LINE

These are readings obtained with the usual Set Analyzers and are not true readings of the voltages at which the Radiotrons operate.

Radiotron No.	Heater to Cathode Volts	Cathode or Filament to Control Grid Volts	Cathode or Filament to Screen Grid Volts	Cathode or Filament to Plate Volts	Plate Current M. A.	Heater Volts
1	3.0	3.0	85	225	4.0	2.2
2	7.0	7.0	65	100	0.25	2.2
3	———	2.0	225	215	30.0	2.2

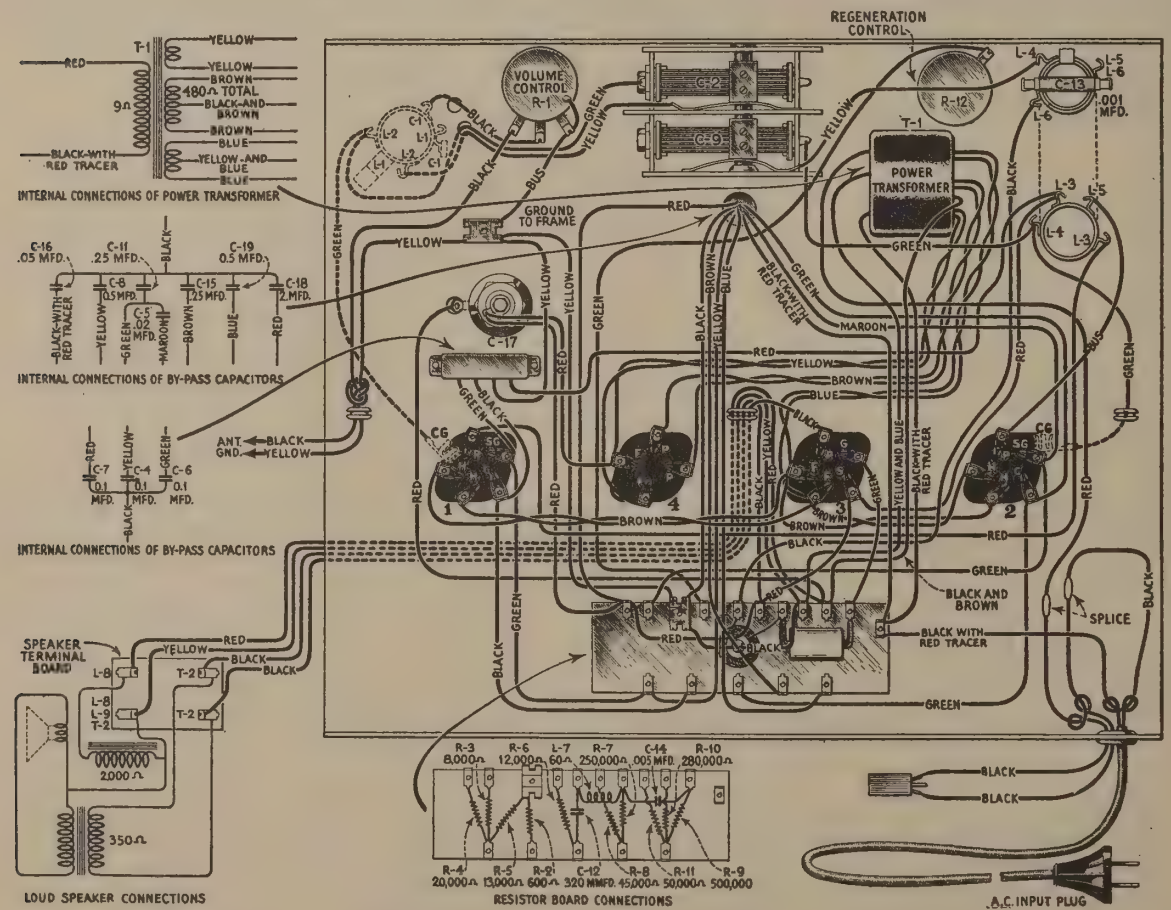


Figure 2—Wiring diagram of Model R-5-X

International Division

RCA Victor Co., Inc.

Camden, N. J. U. S. A.

S. O. 7965 1M—8-3-'31

SERVICE NOTES

for

RCA Victor Radiolette, R-5 D. C.

The RCA Victor Radiolette, R-5 D. C. is a two tuned circuit R. F. type radio receiver. In performance and appearance it is similar to the A. C. model of the R-5.

Two Radiotrons RCA-236 are used as the R. F. amplifier and detector and two Pentode Radiotrons, RCA-238 are used as the push-pull output stage.

The antenna and ground are connected to each side of a 20,000 ohm potentiometer. The moving contact of the potentiometer is connected to the primary of the first R. F. transformer through a 0.00013 mfd. condenser, the other side of the transformer being connected to ground. The action of the potentiometer, reducing the voltage applied to the grid of the first R. F. tube, constitutes that of a volume control. The secondary of the R. F. transformer is connected to the grid circuit of the R. F. Radiotron RCA-236 which is tuned by one unit of the gang condenser. The plate circuit of this tube works into the primary coil of the second R. F. transformer.

The detector is of the regenerative grid bias type and its output is coupled by means of impedance coupling to the output Radiotron RCA-238. The regenerative feature of the detector is unusual in that it uses two regeneration coils. One of these resonates at a low frequency and improves the sensitivity at that end, while the other has but few turns and brings up the sensitivity at the high frequency end.

The output stage uses the RCA-238 Output Pentodes which give a high undistorted output together with a high gain in the stage.

The grid bias for these tubes is obtained by using the drop across a 600 ohm resistor in the cathode circuit of these tubes. This constitutes a self-biasing arrangement.

Plate and grid supply to all tubes is obtained from the D. C. line after being filtered by means of a reactor and 1 mfd. capacitor.

LINE-UP CAPACITOR ADJUSTMENTS

Two adjustable capacitors are provided for aligning the two tuned circuits at the high frequency end of the scale. The following procedure may be used for making any readjustments that may be necessary.

(*a*) Procure an Oscillator giving a modulated signal at exactly 1400 K. C. Also procure a special socket wrench such as RCA Victor Stock No. 3007.

(*b*) An output indicator is necessary. This may be a current squared thermo-galvanometer connected to the secondary of the output transformer in place of the cone coil or other types of output indicators.

(*c*) Turn the station selector until the knob reads exactly 0. Then remove the chassis from the cabinet being careful not to disturb the setting of the dial. The gang condenser rotor plates should be fully meshed with the stator plates, if not, then the dial drum must be adjusted until such a condition exists. Replace the chassis in the cabinet. This may also be checked by looking through the slot in the bottom of the cabinet.

(*d*) Place the Oscillator in operation at exactly 1400 K. C. and couple its output to the antenna lead. Set the dial scale at 85 and place the Radiolette in operation. Place a soft pad on the bench and turn the instrument on its side. Now with the special wrench, adjust each line-up capacitor until maximum output is obtained in the output meter. Be careful to adjust the volume control or oscillator output s than an excessive reading is not obtained. Go over each adjustment a second time to compensate for any interlocking of adjustments.

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
2549	Resistor—250,000 ohm—Carbon type—Package of 5	$3.00
2731	Resistor—10,000 ohm—Carbon type—Package of 5	2.00
2747	Cap—Contact cap for Radiotron—Package of 5	.50
2875	Knob—Volume control or operating switch knob—Package of 5	1.50
2954	Capacitor—By-pass capacitor pack—Containing three 0.1 mfd. capacitors	.75
2956	Transformer—Second R. F. transformer—Complete with mounting washer and nut	2.00
2959	Volume control—20,000 ohm—Complete with mounting washers and nut	1.50
2960	Dial—Dial scale—Complete with set screw—Package of 2	.50
2961	Coil—Detector plate R. F. choke coil	.50
2964	Resistor—13,000 ohm—Carbon type—Package of 5	2.50
2965	Resistor—600 ohm—Carbon type—Package of 5	2.50
2972	Shield—Radiotron shield—Complete with mounting screw, washer and nut	.50
2975	Rivets—Eyelet rivet for mounting cone—Package of 100	.50
2977	Knob—Station selector knob—Package of 5	2.50
2978	Screw assembly—Reproducer mounting screws assembly—Comprising four screws, four washers, four lock washers, eight nuts and four eyelets	.60
2979	Board—Baffle board with grille cloth	.75
2980	Escutcheon—Tuning escutcheon with mounting screws	.75
2981	Capacitor—320 mmfd. detector plate R. F. by-pass capacitor	.50
2990	Resistor—4500 ohm—Carbon type—Package of 5	$2.50
3007	Wrench—Special wrench for R. F. line-up condenser adjustments	1.00
3022	Transformer—First R. F. transformer—Complete with mounting washer and nut	1.50
3023	Switch—Operating switch—With mounting nut and washers	1.50
3098	Capacitor—0.008 mfd.	.50
7229	Socket—Five prong Radiotron socket—Complete insulating shield (4 used)—Package of 2	.50
7232	Capacitor—2 gang variable capacitor	5.00
7235	Coil—Field coil—Complete with bracket and cone ring	2.00
7236	Cone—Reproducer cone with voice coil	1.50
7250	Capacitor—Two 0.025 mfd. in one unit	.60
7251	Capacitor—Comprising one 1.0 mfd., one 0.5 mfd., one 0.1 mfd., one 0.25 mfd., and one 0.025 mfd. in metal container	2.70
7252	Reactor—Coupling reactor	5.75
7253	Board—Resistor board—Less resistors, capacitors and coil assembly	.50
7276	Transformer—Output transformer—With fibre terminal board	1.40
8701	Panel—Cabinet back panel	.75
8702	Ring—Reproducer cone retaining ring	.80
9364	Cabinet—Cabinet complete—Less all equipment	9.00

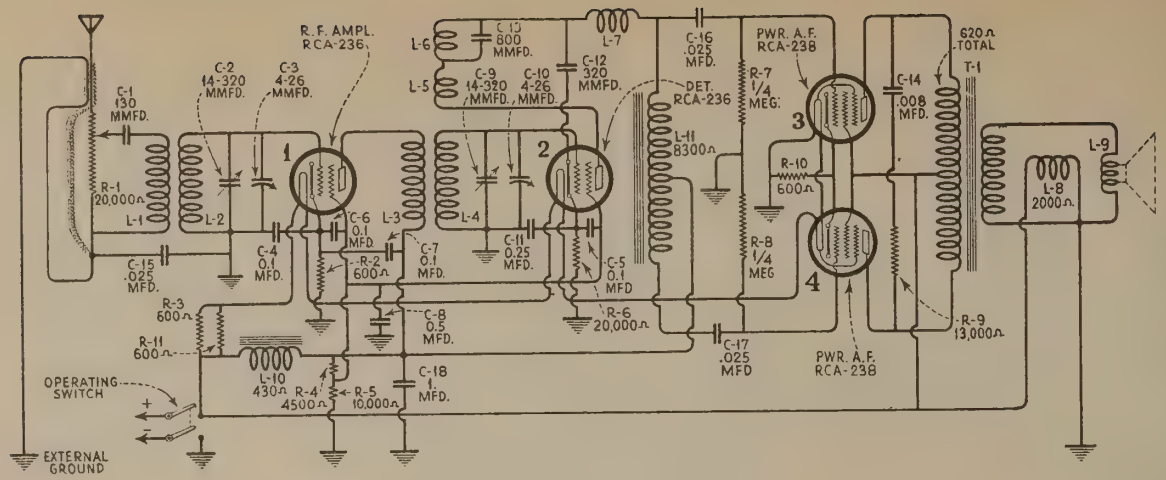


Figure 1—Schematic Circuit Diagram

RADIOTRON SOCKET VOLTAGE

110 VOLT D. C. LINE

These readings are obtained with the usual set analyzers and are not true readings of the voltage at which the Radiotrons operate.

Radiotron No.	Cathode to to Control Grid Volts	Cathode to Screen Grid Volts	Cathode to Plate Volts	Plate Current M. A.	Heater Volts
1	1.5	62	98	2.0	6.0
2	3.2	54	92	0.2	6.0
3	0.3	99	95	5.5	6.0
4	0.3	99	95	5.5	6.0

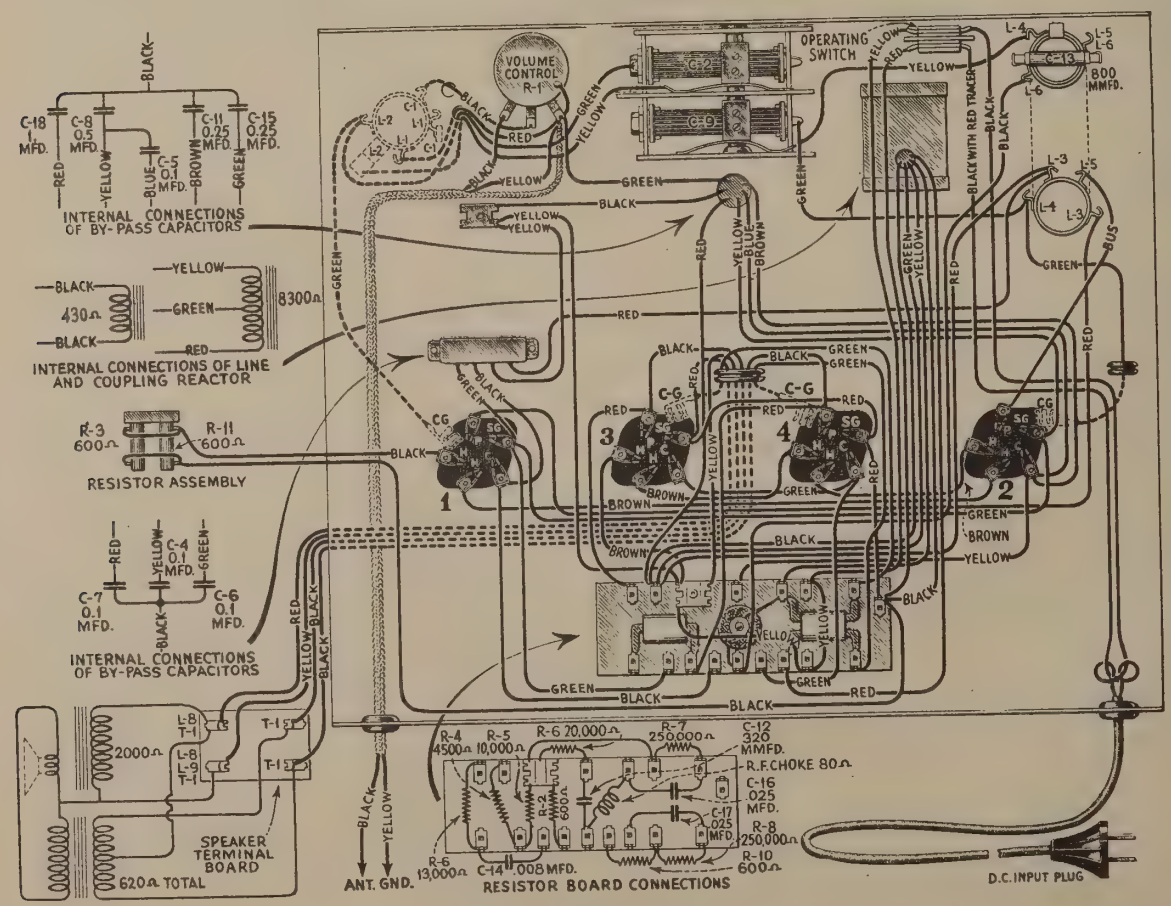


Figure 2—Wiring Diagram

RCA Victor End Table Electrola Model T-5

SERVICE NOTES

ELECTRICAL AND PHYSICAL SPECIFICATIONS

Voltage Rating	105/125 Volts
Frequency Rating	50/60 Cycles
Power Consumption	60 Watts
Type of Magnetic Pickup	Low Impedance
Type of Tone Arm	Inertia
Height	24½ Inches
Depth	12½ Inches
Width	26 Inches
Weight Alone	42 Pounds
Weight Packed for Shipment	52 Pounds

INTRODUCTION

RCA Victor End Table Electrola Model T–5 is a small compact phonograph unit which, when used with RCA Victor receivers, provides record reproduction of excellent quality. It may also be used with other types of receivers, an adaptor being provided for that purpose.

Model T–5 consists of a magnetic pickup, a motor and turntable assembly, record volume control, Radio–Record switch and input transformer assembly and a connecting cable. The entire mechanism is housed in a cabinet of pleasing design.

The proper connections for attaching Model T–5 to various types of radio receivers are covered in the instructions accompanying each instrument. Reference to this sheet should be made whenever an installation is made. Service Data pertaining to the magnetic pickup assembly and the motor assembly is included in the Service Notes on RCA Radiola 86 and Victor Radio Electrola RE–57. This is Victor Service Bulletin No. 26. Reference to these booklets should be made whenever such information is required. Figure 1 shows the wiring diagram and Figure 2 the schematic diagram.

PRECAUTIONS NECESSARY WHEN CONNECTING MODEL T–5 TO VICTOR RADIO R–14, R–15, RADIOLA 42, OR RADIOLA 48

If the set has a tendency to oscillate due to a poor ground, remove the phone tip from the brown cable lead and solder it to the spade terminal of green cable lead. Also place the other end of the brown lead on terminal No. 1 of input transformer.

RCA Victor Company, Inc.

Camden, N.J.

A RADIO CORPORATION OF AMERICA SUBSIDIARY

REPRESENTATIVES IN PRINCIPAL CITIES

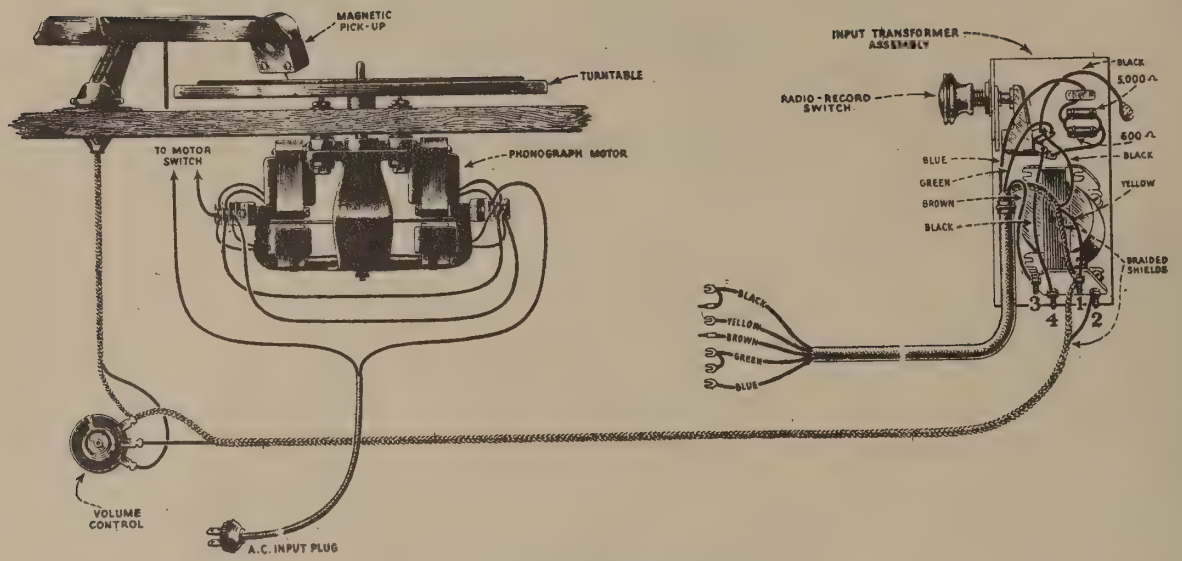


Figure 1—Wiring Diagram of Model T–5

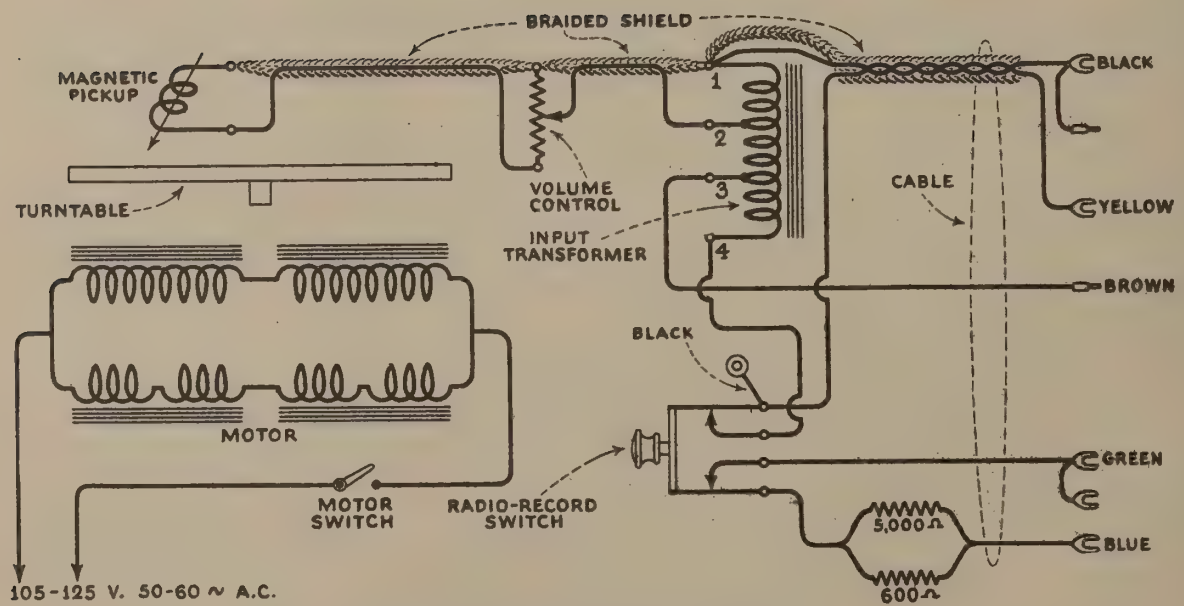


Figure 2—Schematic Diagram of Model T–5

REPLACEMENT PARTS

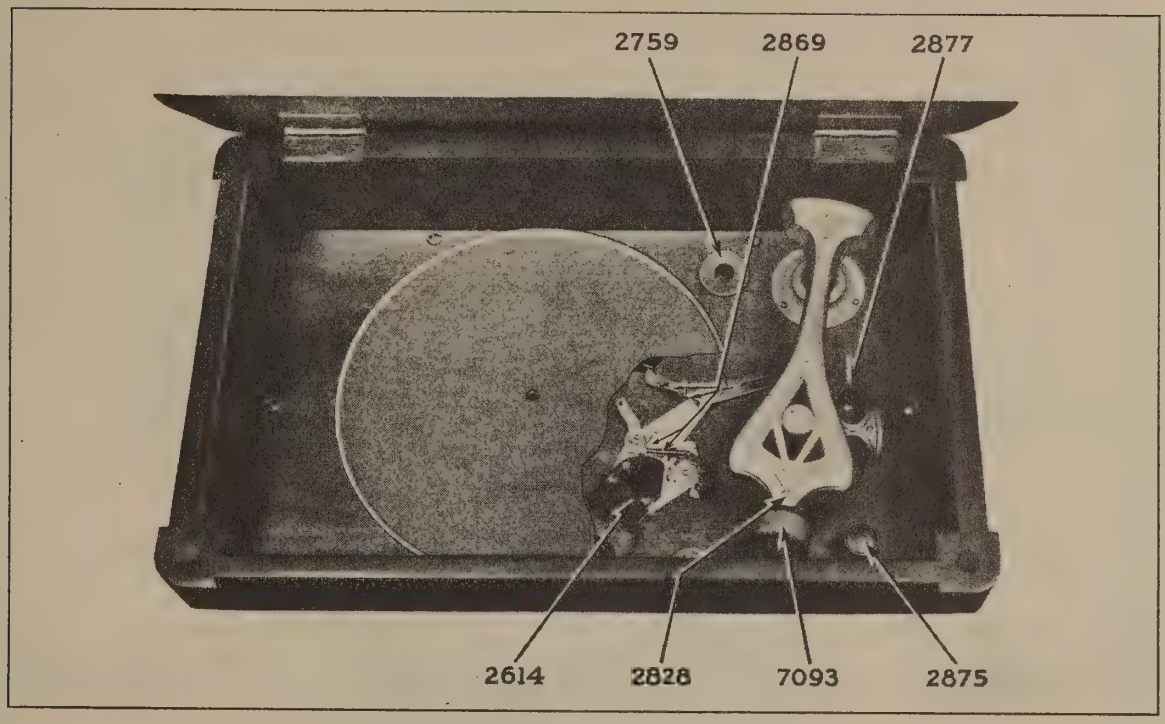


Figure 3—Top View of Motor Board

Stock No.	DESCRIPTION	List Price
	MOTOR BOARD ASSEMBLIES	
2614	Switch—Motor switch for automatic brake	$1.40
2620	Cushion—Rubber damping block and two spacer cushions for armature—One set (Not illustrated)	.50
2677	Gauge—Armature spacing tool (Not illustrated)	.50
2759	Box—Used needle box—Package of 2	.60
2762	Bearing assembly—Governor bearing assembly comprising 2 bearings, 2 set screws and 2 steel balls—3 sets per package (Not illustrated)	.50
2764	Spindle—Turntable spindle and pin	.80
2765	Screw—Pickup needle screw—Package of 10 (Not illustrated)	.80
2766	Screw—Pickup cover screw—Package of 10 (Not illustrated)	.50
2767	Spring—Magnet holding spring for pickup unit—Package of 10 (Not illustrated)	.50
2768	Armature—Magnetic pickup armature (Not illustrated)	.50
2769	Coil—Magnetic pickup coil (Not illustrated)	.50
2781	Felt—Friction felt—Package of 20—(Not illustrated)	.50
2828	Screw and nut—Pickup mounting screw and nut—10 sets per package	.60
2869	Spring—Springs for automatic brake—2 sets of 4 springs	.50
2872	Ball and spring—Governor ball and spring with mounting screws and washers—Package of 5	.75
2873	Screw assembly—Top plate screw, nut, lock washer and ball bearing—Package of 5 sets	$0.50
2874	Spring — Speed regulator spring — Package of 5 (Not illustrated)	.50
2875	Knob—Volume control or transfer switch knob—Package of 5	1.50
2877	Cup—Twin needle cup	.60
7078	Volume control—60 ohm volume control—Complete, less knob	1.50
7087	Gear—Turntable spindle gear with set screw (Not illustrated)	.50
7088	Disc—Rotor disc with set screw	4.00
7093	Cover—Pickup unit cover	.50
7181	Cord—Power cord with male connector	1.00
7182	Cable—Shielded connector cable, approximately 27 feet long—Used to connect end table to radio set	4.00
	CONTROL BOARD ASSEMBLIES	
2870	Resistor—600 ohms resistor—Carbon type—Package of 5	1.50
2871	Resistor—5000 ohms resistor—Carbon type—Package of 5	1.50
2875	Knob—Radio-record transfer switch knob—Package of 5	1.50
2876	Switch—Radio-record transfer switch —Complete, less knob	1.35
2878	Cable—Control board cable	1.30
2879	Adaptor—Special adaptor for connecting control board to detector tube —Package of 5 (Not illustrated)	1.00
7083	Transformer—Pickup input transformer	5.00

Order by Stock Number only

REPLACEMENT PARTS—Continued

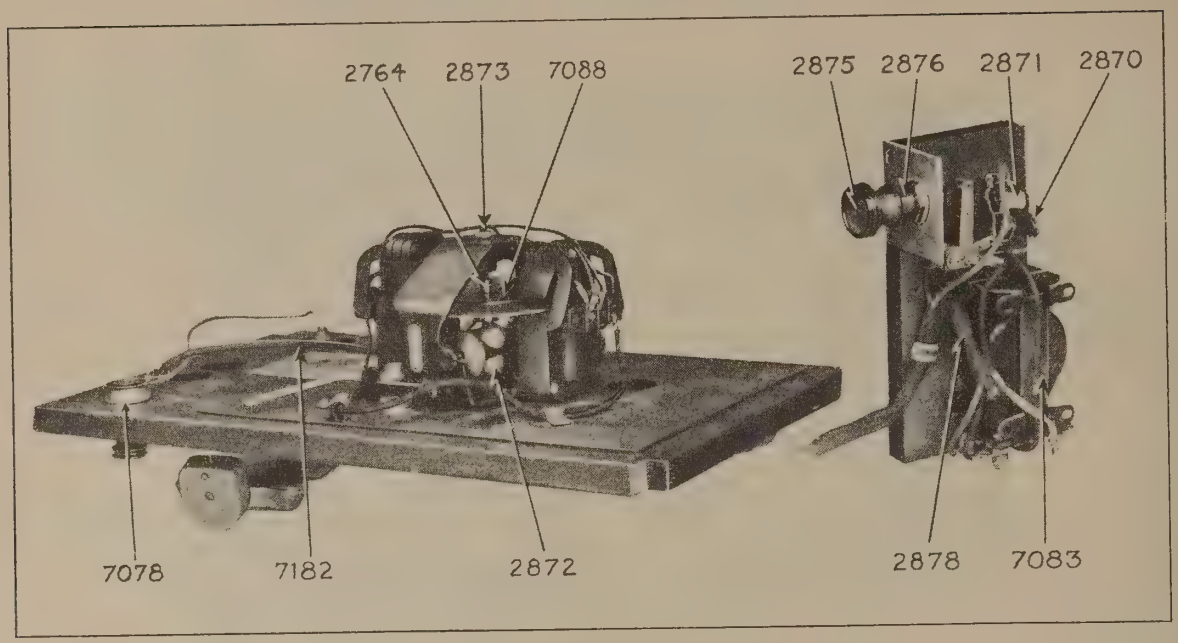


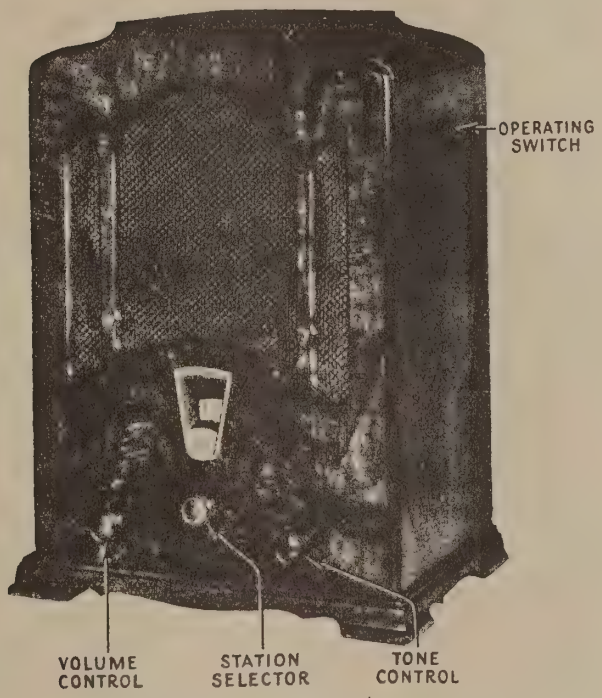
Figure 4—Bottom View of Motor Board and Control Board

Stock No.	DESCRIPTION	List Price
	SPECIAL PARTS SUPPLIED ON ORDER ONLY (Not to be Stocked)	
2763	Bolt assembly — Motor mounting bolts, washers, nuts and rubber cushion—1 set per package (Not illustrated)	$1.00
2770	Plate—Damper plate and rubber damper—For pickup unit—Package of 5 (Not illustrated)	.50
2771	Screw—Damper plate mounting screw —Package of 10 (Not illustrated)	.50
2772	Magnet—Pickup magnet (Not illustrated)	2.60
2773	Pole piece—Right pole piece for pickup unit (Not illustrated)	.50
2774	Rod—Trip rod assembly comprising threaded rod and nut—Package of 5 (Not illustrated)	.50
2778	Pole piece—Left pole piece for pickup unit (Not illustrated)	.50
2781	Leather—Friction leather for eccentric automatic brake—Package of 20 (Not illustrated)	.50
2785	Hinge—Lid hinge with mounting screw—Package of 2—(Not illustrated)	.50
7077	Regulator—Speed regulator complete with mounting screws–Package of 2 (Not illustrated)	.60
7084	Cover—Turntable cover (Not illustrated)	.50
7085	Pickup—Pickup unit complete (Not illustrated)	12.50
7086	Lever—Speed regulating lever with friction felt and set screw—Package of 2 (Not illustrated)	$0.50
7089	Governor assembly—Complete governor comprising spindle, collar, disc, sleeve, balls and springs, washers and screws (Not illustrated)	2.50
7092	Arm—Pickup arm and base—Complete, less pickup unit (Not illustrated)	3.50
7151	Back—Pickup unit back (Not illustrated)	.50
7177	Coil—Inductor coil 105/125 volts, 60 cycles (Not illustrated)	10.00
7178	Coil—Inductor coil 105/125 volts, 25 cycles (Not illustrated)	10.00
7179	Block—Inductor terminal block (Not illustrated) Package of 5	1.00
7180	Brake—Eccentric automatic brake—Complete (Not illustrated)	3.40
7183	Support—Lid support with mounting screws—Package of 2 (Not illustrated)	.50
8582	Turntable—Turntable complete with cover (Not illustrated)	3.00
8612	Motor—Induction disc motor 105/125 volts, 25 cycles (Not illustrated)	36.50
8640	Motor—Induction disc motor 105/125 volts, 60 cycles (Not illustrated)	36.50
9315	Post—R. H. front or L. H. back post (Not illustrated)	
9316	Post—L. H. front or R. H. back post (Not illustrated)	
9317	Lid—Less hardware (Not illustrated)	
9318	Shelf—Bottom shelf (Not illustrated)	

Order by Stock Number only

RCA Victor Radiola Superette

SERVICE NOTES



RCA Victor Radiola Superette

[Second Edition—15M
Copyright, April, 1931]

RCA Victor Company, Inc.
Camden, N.J.
A RADIO CORPORATION OF AMERICA SUBSIDIARY
REPRESENTATIVES IN PRINCIPAL CITIES

Property of the RCA Victor Company, Inc. Confidential and to be used only by its Authorized Distributors and Dealers in furnishing service in connection with its apparatus

---

Copyright 1931—RCA Victor Company, Inc.

CONTENTS

Page

Electrical Specifications 5
Physical Specifications 5
Introduction 5
Electrical Description of Circuit 5

PART I—REPLACEMENT PARTS

Page

Replacement Parts—Key Nos. 1 to 29 8
Replacement Parts—Key Nos. 30 to 42 9

PART II—INSTALLATION

Page

Antenna and Ground 10
Radiotrons 10
Location 10
Adjustment for Low Line Voltages 10

PART III—SERVICE DATA

Page

Noisy Volume or Tone Control 11
Condenser Drive 11
Excessive Hum 11
Acoustic Howl 12
Low Volume 12
Distorted Reproduction 13
Audio Howl 13
Oscillation 14
Radio Frequency Line-up and Oscillator Trimming Condenser Adjustments 14
Intermediate Frequency Tuning Condenser Adjustments 15
Line-up Adjustments of Gang Condenser 16

PART IV—ELECTRICAL TESTS

Page

Voltage Supply System 17
Voltage Reading Service Data Chart ..... 17 and 18
Voltage Readings at Radiotron Sockets 17
Continuity Tests 19
Testing Condensers 22
Checking Resistance Values 22
Magnetic Pickup Connections 23

PART V—MAKING REPLACEMENTS

Page

Removing Chassis from Cabinet 23
Replacing Reproducer Cone 23

ILLUSTRATIONS

Page

Front View 1
Rear Interior View 4
Schematic Circuit 6
Top View of Chassis Showing Key Numbers 8
Bottom View of Chassis Showing Key Numbers 9
Top View of Chassis Showing Parts 10
110 Volt Connections 11
Tone Control 12
Adjusting 1400 Kilocycle Condensers 13

Page

Adjusting 600 Kilocycle Condensers 14
Adjusting Intermediate Frequency Condensers 15
Schematic Diagram of Voltage Supply System 16
Socket Location 19
Continuity Schematic Diagram 19
Wiring Diagram 20
Magnetic Pickup Connections 22
Centering Cone 23

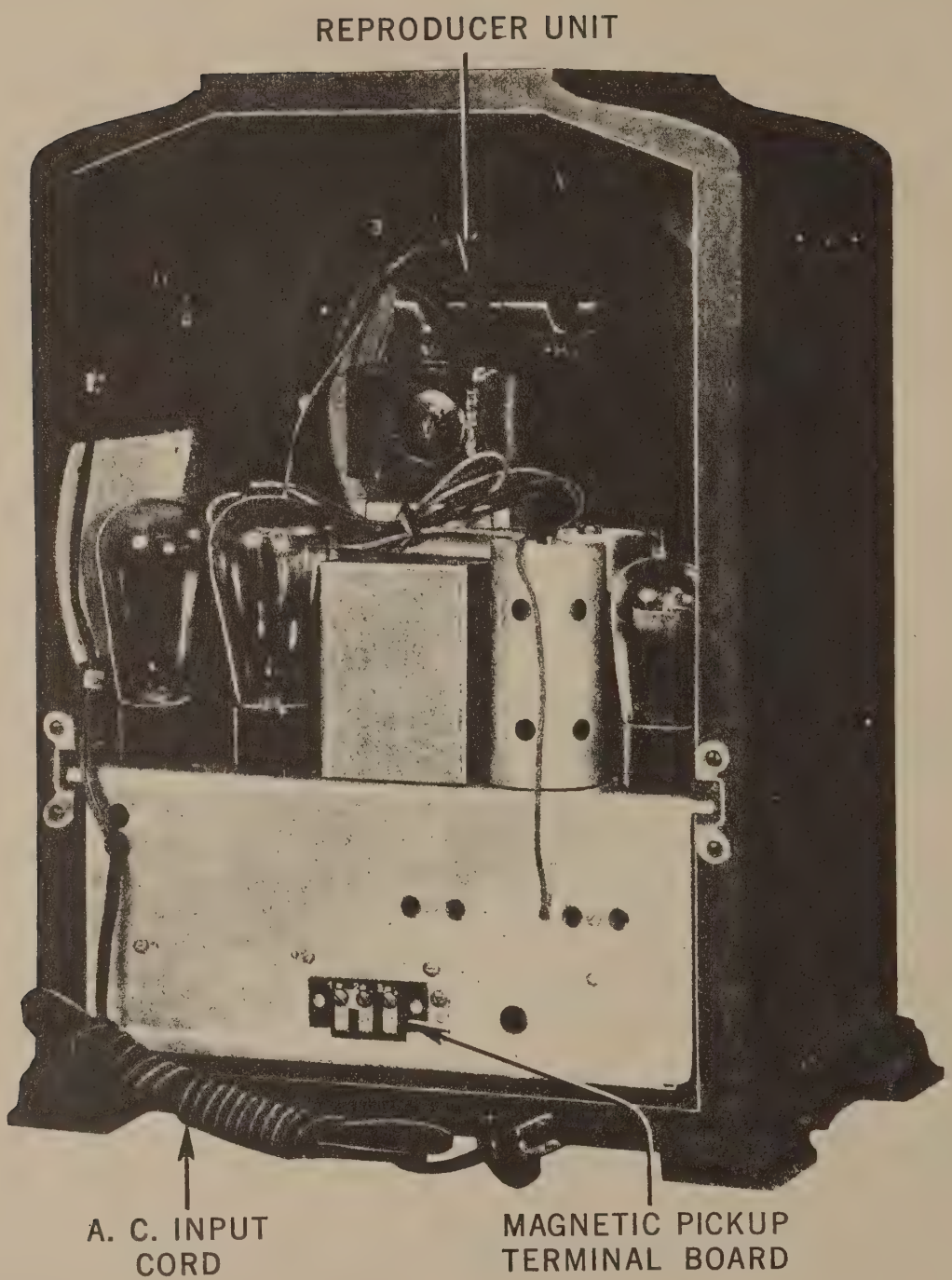


Figure 1—Rear Interior View of RCA Victor Radiola Superette

RCA Victor Radiola Superette

SERVICE NOTES

ELECTRICAL SPECIFICATIONS

Voltage Rating	105/125 Volts
Frequency Rating	50/60 Cycles, or 25/50 Cycles
Power Consumption	60 Cycles/100 Watts—25 Cycles/100 Watts
Recommended Antenna Length	25/75 Feet
Type of Circuit	A. C. Screen Grid Super-Heterodyne
Type and Number of Radiotrons	2 RCA-235, 1 UY-224, 2 UY-227, 2 UX-245, 1 UX-280, Total of 8
Number of Radio Frequency Stages	One
Type of First Detector	Tuned Input Grid Bias
Number of Intermediate Stages	One
Type of Second Detector	Power Grid Bias
Number of Audio Stages	One (Push-Pull)
Type of Rectifier	Full Wave, UX-280
Type of Loudspeaker	Dynamic
Wattage Dissipation in Loudspeaker Field	8.0 (100 Volts/80 M. A.)
Undistorted Output	3.0 Watts

PHYSICAL SPECIFICATIONS

Height	19 inches
Depth	10 inches
Width	14 inches
Weight Alone	37 pounds
Weight (Packed for Shipment)	44 pounds
Packing Case Dimensions	16¾" x 12⅞" x 23¼"

INTRODUCTION

The RCA Victor Radiola Superette is a compact radio receiver employing the super-heterodyne circuit. The inherent sensitivity, selectivity and tone quality of the super-heterodyne is a feature of this receiver. The unit type of construction is used (both S. P. U. and receiver assembly incorporated in the same chassis) which together with the reproducer unit results in a compact receiver of excellent performance. The entire mechanism is enclosed in a cabinet of pleasing design. Figure 1 shows a rear interior view.

Two Radiotrons UY-227, two Radiotrons RCA-235, two Radiotrons UX-245, one Radiotron UY-224 and one Radiotron UX-280 are used. The Radiotrons are shipped in their respective sockets.

ELECTRICAL DESCRIPTION OF CIRCUIT

The schematic diagram of the RCA Victor Radiola Superette is shown in Figure 2. Starting from the antenna circuit, we find the following action taking place in the various stages.

The antenna is coupled to the grid coil of the R. F. stage by means of a high inductance coil connected from antenna to ground. This inductance has a sufficiently high value so that variations in the antenna system have but little effect on the tuning of the adjacent circuit.

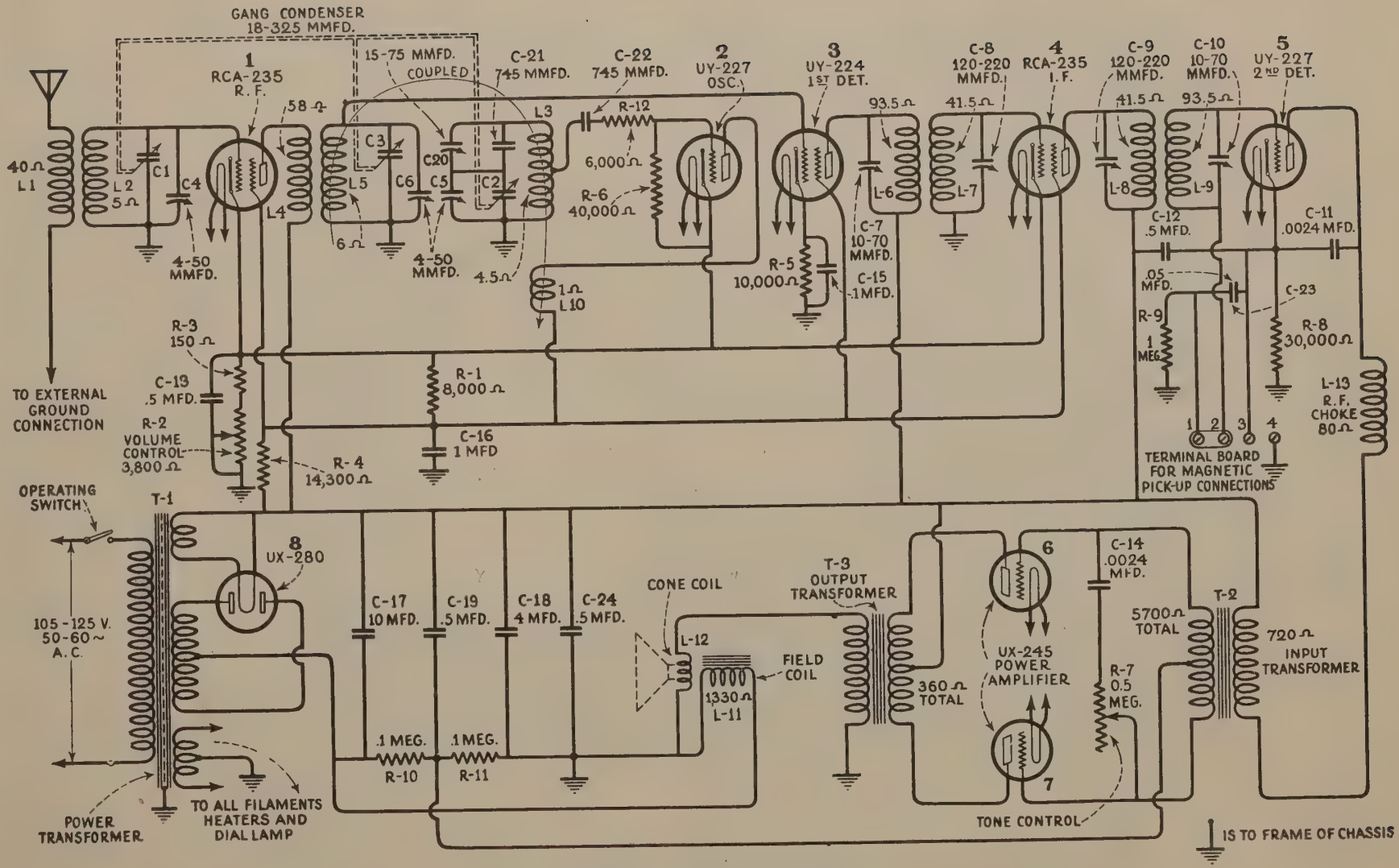


Figure 2—Schematic Wiring Diagram

The first tube is a tuned R. F. stage. This is the new Super Control Screen Grid Radiotron, RCA-235, which has a grid potential plate current curve that has no pronounced "knee." This characteristic reduces the tendency of the tube to become a detector when the control grid voltage is raised by the volume control. Such a characteristic means that secondary modulation effects will not be obtained and distortion due to high signal intensities will not develop. Also improved volume control action and elimination of the local-distant switch are obtained through the use of Radiotron RCA-235. The gain and other characteristics are approximately the same as those of Radiotron UY-224. The output of this circuit is inductively coupled to the grid coil of the first detector.

At this point the oscillator should be considered as its output is also coupled inductively to the grid coil of the first detector. This is a tuned grid circuit oscillator using a Radiotron UY-227, and having a closely coupled plate coil that gives sufficient feed-back to provide stable operation. The grid circuit is so designed that by means of a correct combination of capacity and inductance a constant frequency difference between the oscillator and the tuned R. F. circuits throughout the tuning range of the receiver is obtained.

The next circuit to examine is the first detector. The circuit is tuned by means of one of the gang condensers to the frequency of the incoming signal. In the grid circuit there is present the incoming signal and the oscillator signal, the latter being at a 175 K. C. difference from the former. The first detector is biased so as to operate as a plate rectification detector and its purpose is to extract the difference or beat frequency, produced by combining the signal and oscillator frequencies. The beat frequency—175 K. C.—appears in the plate circuit of the first detector which is accurately tuned to 175 K. C. The tube used as a first detector is Radiotron UY-224.

The next stage is that of the I. F. amplifier. A single stage is used. This requires two I. F. transformers consisting of four tuned circuits. The plate circuit of the first detector, the grid and plate circuit of the I. F. amplifier and the grid circuit of the second detector are all tuned to 175 K. C. The transformers are peaked, no attempt being made for flat top tuning. A Radiotron RCA-235 is used in this stage and its control grid voltage is also varied by means of the volume control.

The second detector is a high-plate voltage, grid-biased type, using Radiotron UY-227, which gives sufficient output to drive two Radiotrons UX-245 connected in push-pull without an intermediate audio stage. The purpose of the second detector is to extract the audio frequency component of the R. F. signal which represents the voice or musical modulations produced in the studio of the broadcasting station. The audio component is extracted and used to drive the power tubes while the R. F. current is by-passed and not used further.

A filter circuit consisting of a 0.05 mfd. condenser and 1 megohm resistor is used in the second detector grid circuit. This further reduces the small A. C. hum voltages present in the detector stage.

The power A. F. stage consists of two Radiotrons UX-245 connected in push-pull. Transformer coupling is used between the detector and the grids of the Radiotrons UX-245 as well as from the plates to the cone coil of the reproducer unit.

A tone control, consisting of a 0.0024 mfd. condenser in series with a 500,000 ohm variable resistor connected across the two grids of Radiotrons UX-245, is incorporated in this stage. The tone control functions to reduce the high frequency output as the resistance is reduced. At the extreme low position, the condenser and secondary of the A. F. transformer resonate at a low frequency and thereby further accentuate the bass response, thus partially compensating for the lack of a large speaker baffle surface.

The direct plate and grid voltages used by all the tubes are supplied from high voltage alternating current which is rectified by means of Radiotron UX-280. The filter used is of the "brute force" type using the field of the reproducer unit as the reactor. Electrolytic type condensers of 10 and 4 mfd. capacity respectively are used before and after the reactor. Two 0.5 mfd. condensers in the filter circuit function to by-pass any R. F. current that may be present. The bias voltage (50 volts) for Radiotrons UX-245 is obtained by using half the voltage drop (100 volts) across the field coil of the reproducer unit. Two 100,000 ohm resistors shunted across the field act as the voltage dividing resistor for this bias voltage.

PART I—REPLACEMENT PARTS

The replacement parts used in this instrument are listed on pages 8 and 9. The key numbers shown in the illustrations provide a quick reference for illustration to text.

REPLACEMENT PARTS

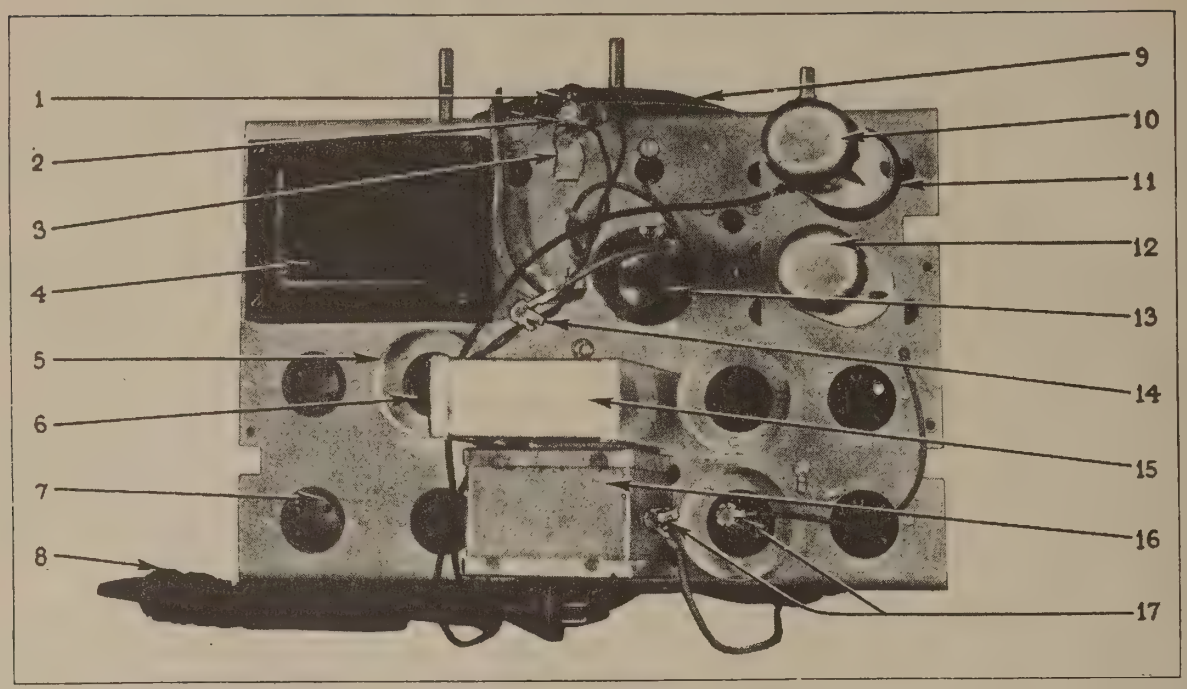


Figure 3—Top View of Chassis

Key No.	Stock No.	DESCRIPTION	List Price
		CHASSIS PARTS	
1	A2429	Lamp—Dial lamp	$0.12
2	A516	Socket—Dial lamp socket	.50
3	B2323	Bracket—For dial lamp socket	.04
4	A36	Transformer—105/125 volts, 50/60 cycles power transformer	9.00
	A37	Transformer—105/125 volts, 25/50 cycles power transformer	12.00
5	A1727	Base—Tube shield base—3 used	.10
	A1728	Shield—Tube shield—3 used	.18
6	A522	Socket—UY Radiotron socket—Complete with insulating shield —5 used	.40
7	A523	Socket—UX Radiotron socket—Complete with insulating shield —3 used	.40
8	A1582	Cord—Power cord complete with male connector plug	.75
9	B2326	Scale—Dial scale complete with drum and set screws	.60
	A3276	Screw—Set screw for dial scale drum—Package of 12 doz.	.24
	B2324	Shaft—Drive shaft for operating dial	.50
10	A268	Condenser—10 mfd. electrolytic condenser	3.00
11	A3031	Washer—For 10 mfd. electrolytic condenser	.10
	A745	Terminal—For 10 mfd. electrolytic condenser	.04
12	A267	Condenser—4 mfd. electrolytic condenser	2.50
13	A138	Transformer—R. F. transformer complete with mounting bracket, nut and lock washer	1.90
14	B2332	Cap—Grid contactor cap for R. F. socket	
15	A266	Capacitor Pack—R. F. by-pass capacitor pack	$3.50
16	A35	Transformer assembly — A. F. transformer assembly complete in metal container	6.00
17	A2398	Cap—Grid contactor cap for I. F. or 1st detector tubes	.10
18	A375	Resistor—150 ohms—Carbon type	.40
19	A369	Volume Control—Complete less knob	2.20
	A2304	Knob—Volume control, station selector or tone control knob	.30
	A2710	Nut—Volume control mounting nut	.04
20	A139	Coil—1st detector and oscillator coil complete with mounting bracket, screws and lock washers	2.40
21	A272	Condenser — 745 mmfd. — Oscillator grid or series condenser	.44
22	A372	Resistor — 40,000 ohms — carbon type	.40
23	A373	Resistor — 6000 ohms — carbon type	.60
24	A338	Resistor — 8000 ohms — carbon type	.40
25	A135	Transformer—1st I. F. transformer complete with shield	3.00
26	A136	Transformer—2nd I. F. transformer complete with shield	3.00
	A1729	Shield—Copper shield for I. F. transformer	.60
27	A744	Terminal—Single terminal complete with screw	.06
28	A959	Board—Magnetic pickup terminal board complete with terminals and screws	.25
29	A370	Tone control—Complete less knob	2.00

REPLACEMENT PARTS—Continued

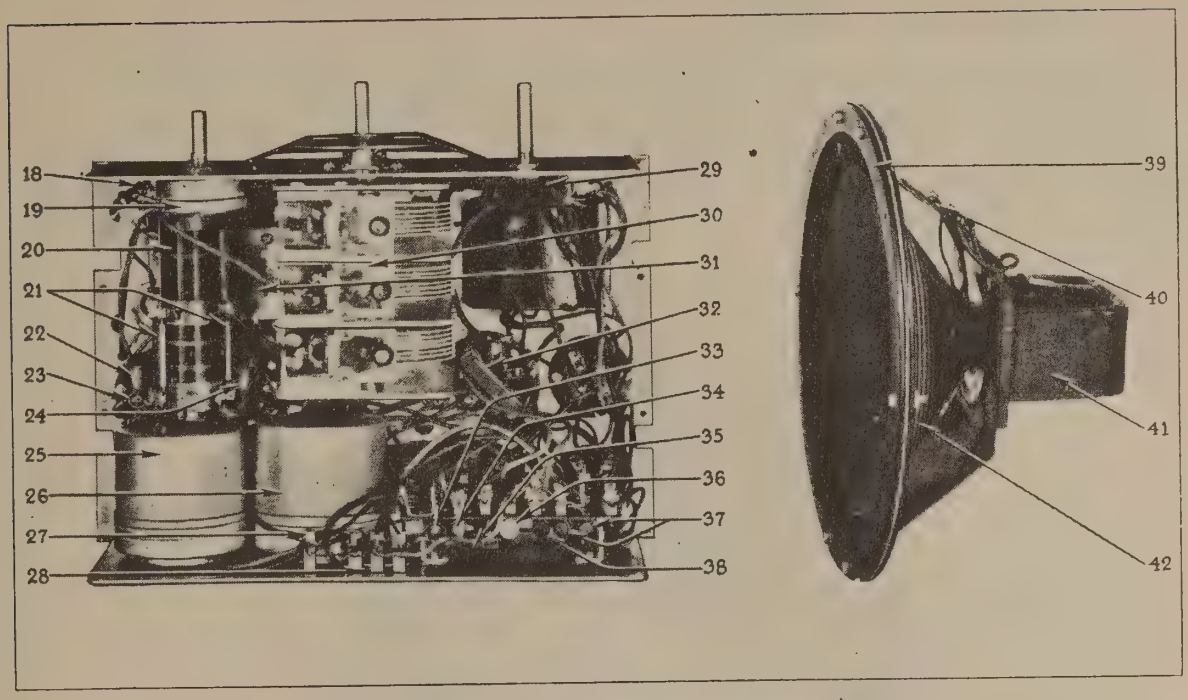


Figure 4—Bottom View of Chassis and Reproducer Unit

Key No.	Stock No.	DESCRIPTION	List Price
30	A269	Condenser—Three gang tuning condenser—Complete with line-up condensers and mounting screws	$8.00
31	A270	Condenser—Adjustable oscillator trimming condenser	1.00
	A3275	Screw—Adjusting screw for oscillator trimming condenser—Package of 10	.50
32	A271	Condenser—.0024 mfd. fixed condenser—Used as tone control or 2nd detector by-pass condenser	.80
33	A371	Resistor — 14,300 ohms — Carbon type	.60
34	A329	Resistor—1 megohm—Carbon type	.40
35	A137	Coil—2nd detector R. F. choke coil complete with rivet	.50
36	A313	Resistor—30,000 ohms—carbon type	.40
37	A368	Resistor—100,000 ohms—carbon type—two used	.40
38	A374	Resistor—10,000 ohms—carbon type	.40
	A960	Board—Resistor mounting board complete with terminals and mounting bracket—less resistors	1.00
	B2325	Insulator — For chassis shield — complete with rivets	.02
	B2330	Support—Rubber chassis support	.06
	A427	Switch—Operating switch complete with mounting nuts	.68
	A1867	Escutcheon—Dial scale escutcheon	.60
	B2331	Board — Baffle board complete with grille cloth	1.00
		LOUDSPEAKER PARTS	
39	A2421	Ring—Cone retaining ring	.35
	A3226	Screw—Cone mounting screw—Package of 12 doz.	.12
	A2987	Washer—Lock washer for mounting cone—Package of 12 doz.	.10
	A2702	Nut—For cone mounting screw—Package of 12 doz.	$ 0.06
	A3136	Screw—Cone centering screw—Package of 12 doz.	.24
	A2993	Washer—For cone centering screw—Package of 12 doz.	.12
	A3277	Screw—Special head screw for mounting loudspeaker to cabinet—Package of 12 doz.	1.20
	A2744	Nut—For loudspeaker mounting screw—Package of 12 doz.	.12
40	A942	Board — Loudspeaker terminal board	.16
41	8653	Coil Assembly—Field coil, core and cone support	5.00
42	A2446	Cone—Loudspeaker cone	3.00
		TOOLS	
	A6000	Screwdriver—Non-metallic screwdriver for oscillator and I. F. adjustments	.70
		line-up condenser adjustments	
	A6001	Wrench—Socket wrench for R. F.	.75
	A6004	Oscillator—Broadcast band oscillator comp. with batteries and Radiotron	10.00
		SPECIAL PARTS SUPPLIED ON ORDER ONLY (Not to be stocked)	
	9325	Cabinet—Cabinet complete with baffle board, grille cloth and escutcheon (Walnut)	15.00
	9326	Cabinet—Cabinet complete with baffle board, grille cloth and escutcheon (Mahogany)	15.00
	B2329	Loudspeaker—Dynamic loudspeaker complete	8.70
	B2328	Chasis—Receiver chasis complete—less loudspeaker	10.00
	8654	Transformer—220 Volt, 50-60 cycle power transformer	11.00

PART II—INSTALLATION

(1) ANTENNA AND GROUND

Instructions for erecting proper antenna and ground systems are covered in earlier Service Notes. The length recommended for use with the RCA Victor Radiola Superette is from 25 to 75 feet. In localities remote from broadcasting stations a longer antenna may give better results.

In localities close to extremely powerful transmitters the use of a single pole, single throw switch, placed in series with the antenna may give improved results. This switch allows the antenna to be disconnected when receiving from powerful nearby stations, thereby improving the quality of output from the loudspeaker.

The antenna is connected to the black lead and the ground to the yellow lead.

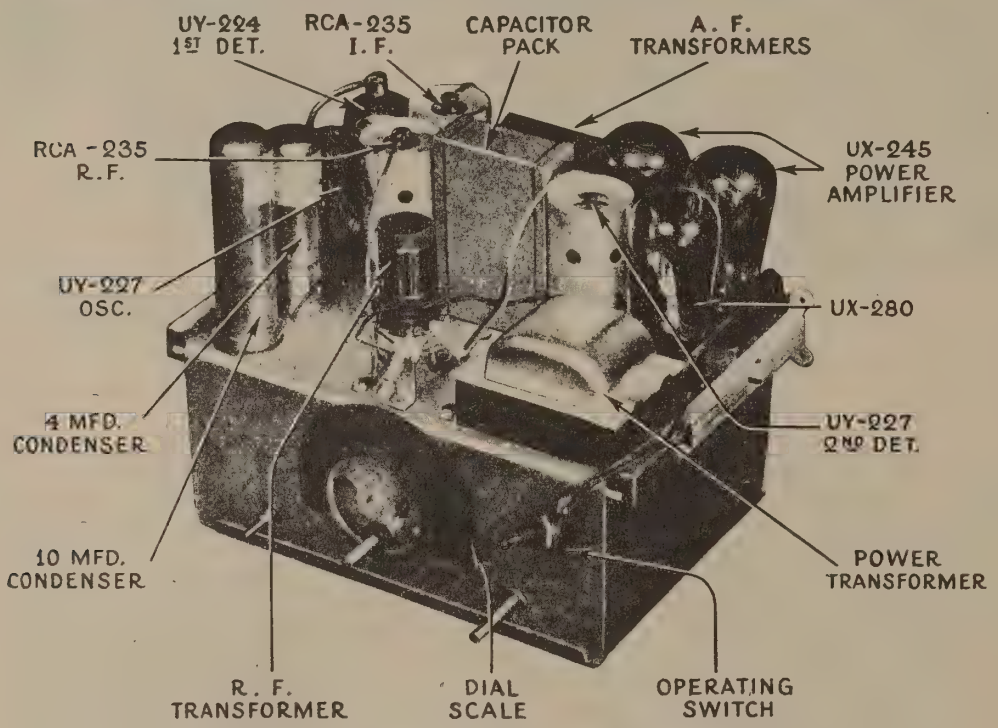


Figure 5—Top View of Chassis Showing Location of Radiotrons and Parts

(2) RADIOTRONS

Figure 5 shows the location of the various Radiotrons when inserted in their proper sockets. Interchanging those of the same type, either RCA-235 or UY-227 will sometimes give improved results.

(3) LOCATION

Various locations should be tried before permanently installing the RCA Victor Radiola Superette as different parts of the room may give different acoustical results. However, the eight foot A. C. cord may prove a limiting factor if the A. C. outlet is not within its radius. An extension cord may be provided, however, and the receiver placed in the location that produces best results. Placing the set within six inches of the wall will improve the low response.

(4) ADJUSTMENT FOR LOW LINE VOLTAGES (25 Cycle Only)

A lead connected to the 110 volt tap on the power transformer of 25 cycle models is provided for use when RCA Victor Radiola Superette is used on lines, the voltage of which never exeeeds 115 volts. Should such an adjustment become necessary, proceed as follows:

(a) Remove the chassis from the cabinet. Release the four nuts, screws and lock washers that hold the bottom cover to the chassis and remove the bottom

(b) A black and red transformer lead, taped up and not used, will be found on the underside of the chassis. Also a black with red tracer transformer lead is soldered to a terminal on the resistor board. (See Figure 6.)

(c) Interchange these two leads, soldering the black and red lead to the terminal and taping up the black with red tracer lead.

(d) Replace the cover on the bottom of the chassis and then return the chassis to the cabinet.

So connected the receiver will operate on lines the voltage of which is from 105 to 115, with maximum efficiency.

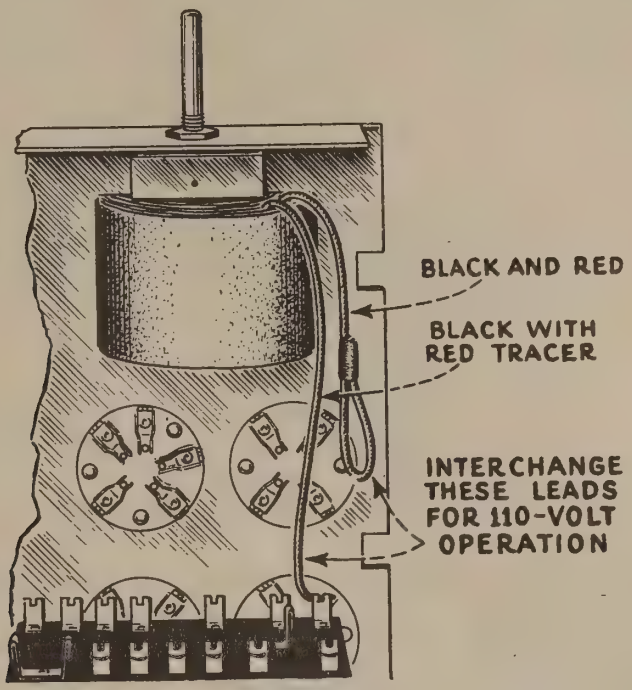


Figure 6—Changes Necessary for 110 Volt Operation on 25 Cycle Models

PART III—SERVICE DATA

(1) NOISY VOLUME OR TONE CONTROL

Noisy operation of the volume control or tone control is usually caused by dirt between the resistance element and the contact arm. Turning the volume control back and forth several times will usually clear up the trouble. If it does not, the cover must be removed and the resistance element cleaned. Figure 7 shows the method of removing the cover on the tone control. One of the various cigarette lighter fluids applied with a pipe cleaner will usually clear up the trouble. If it does not, the unit must be replaced.

(2) CONDENSER DRIVE

The gang condenser is driven from the station selector knob by means of a small rubber friction roller. The dial has an inside track which is driven by a small rubber pinion. A long period of wear may cause the rubber to become worn or hard and therefore require replacement. The holes by which the roller brackets are mounted are elongated. Should the roller fail to maintain the proper amount of friction with the dial drum, an adjustment can be easily made.

(3) EXCESSIVE HUM

Excessive hum may be caused by:

(a) Defective Radiotron UX-280.

(b) Defective power transformer. Key No. 4, page 8. (Open or off-center tap.)

(c) Shorted 0.05 mfd. condenser in second detector circuit. Key No. 15, page 8.

(d) Defective 1 megohm resistor in the second detector circuit. Key No. 34, page 9.

(e) Shorted field coil. As the field coil of the reproducer unit constitutes the reactor of the filter system, a failure in it will cause hum.

(f) Open filter condenser. An open in the condenser or connection of either the electrolytic or paper condenser used in the filter system will cause hum. Key Nos. 11 and 12, page 8.

(g) Grounded or shorted by-pass condensers. Key No. 15, page 8. Test all condensers and replace any found defective.

(h) Grounded heater lead. A grounded heater lead at either the points of connection to the sockets or in the transformer will cause hum.

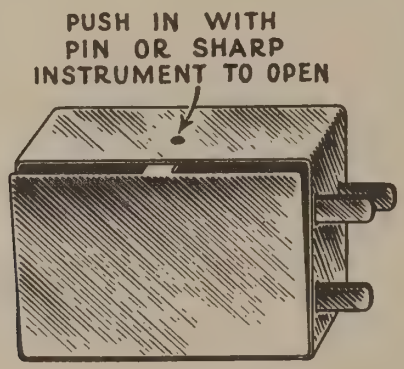


Figure 7—Method of Opening Tone Control

(4) ACOUSTIC HOWL

Acoustic howl may be caused by:

(a) Hardened rubber used for chassis supports. If this condition is present, the rubber must be replaced.

(b) Microphonic tube. Try interchanging the second detector and oscillator tubes.

(c) Loose parts in chassis. Tighten any loose parts.

(d) Chassis not entirely supported on rubber from cabinet. If the chassis, including the knobs and their shafts, is touching the cabinet, howl may result. Clear any such contact.

(5) LOW VOLUME

Low volume may be caused by:

(a) Inoperative Radiotrons. Try interchanging all Radiotrons with others of *similar type* known to be in good condition.

(b) Poor antenna system. Install antenna and ground system as suggested in other issues of Service Notes.

(c) Receiver improperly aligned. Check R. F. oscillator and I. F. tuning condenser adjustments as described in Part III, Sections 9, 10 and 11.

(d) Defective A. F. transformer. Key No. 16, page 8. The A. F. transformers are in a metal container, the internal connections of which are shown in Figure 14. All coils should be tested for continuity and possible grounds. If other defects are likely, measure the coils for D. C. resistance. Shorted turns may be disclosed by substituting an entirely new unit for the one in use.

(e) Low voltages. Measure all voltages and if low replace Radiotron UX-280 or any defective parts that are causing low voltage. Check by means of voltage reading chart, page 18.

(f) Opens, shorts or grounds in receiver assembly. Repair any defects of this type.

(g) Shorted field coil in reproducer unit. Any defect that reduces the strength of the magnetic field of the reproducer unit will reduce the output of the receiver. Check the current (80 M. A.) and the voltage drop (100 volts) across it. An open field coil will cause the receiver to become inoperative.

(6) DISTORTED REPRODUCTION

Distorted reproduction, not due to failure in the reproducer unit, may be caused by any of the following:

(a) Radiotrons. A defective Radiotron will cause distortion and can be defective even though it lights. Defects other than heater or filament failures are checked only by substitution with a tube of known quality or by testing the tube.

(b) Defective A. F. transformers. Key No. 16, page 8. An open in the secondary of the input transformer or shorted turns in any windings may cause distortion. Test by means of continuity or resistance measurement tests and make replacement if necessary.

(c) Oscillation in receiver assembly. Oscillation in the receiver assembly other than that of the oscillator will cause distortion to be experienced when tuning in a station. This distortion will be accompanied by a whistle when the station is tuned in. To remedy trouble of this character, refer to Part III, Section 8.

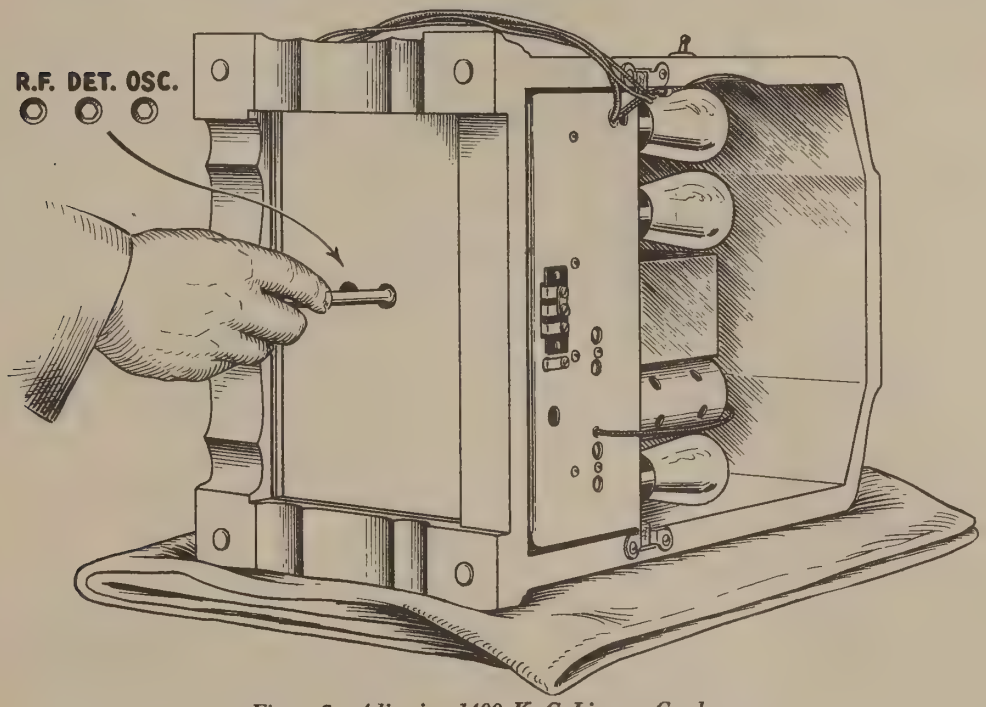


Figure 8—Adjusting 1400 K. C. Line-up Condensers

(d) Receiver improperly aligned. Improper alignment of the receiver in addition to affecting its sensitivity and selectivity, will cause distortion of any signal received. Realign the receiver as described in Part III, Sections 9, 10 and 11.

(e) Incorrect tuning. If the receiver is not accurately tuned to the station being received, distortion will result. Follow the instructions given on the instruction leaflet accompanying each set when tuning.

(f) Heterodyne between stations too close in frequency. This is no defect in the receiver and, therefore, cannot be remedied except by shifting the frequencies of the transmitters.

(g) Strong local station. Interchange the R. F. tube with the I. F. tube. Shorten the antenna. Place a switch in antenna lead. See Part II, Section 1.

(h) Open by-pass condensers or connections. Key No. 15, page 8. Any failure that will cause a by-pass condenser not to function will result in distortion. Repair or replace any such defect.

(i) Defect in receiver assembly or S. P. U. Check by means of continuity tests and make any replacement necessary.

(7) AUDIO HOWL

Audio howl may be caused by:

(a) Stations too close in frequency. This is a fault of the transmitting stations and no fault of the receiver. Such a howl will be picked up on any type of receiver.

(b) Open by-pass condensers. Key No. 15, page 8. An open of any of the by-pass condensers may cause an audio howl.

(c) Receiver oscillation. An oscillating receiver will give a whistle when a station is tuned in. Apply the remedies suggested in Part III, Section 8.

(d) Defective Radiotrons in push-pull or detector stage. A defective Radiotron in the push-pull or detector stage may cause the receiver to develop a howl. Replace any defective Radiotron.

(e) Vibrating elements in the receiver Radiotrons. A gradually developed howl may be due to the loudspeaker, causing the receiver Radiotron elements to vibrate. Apply the remedies given in Part III, Section 4.

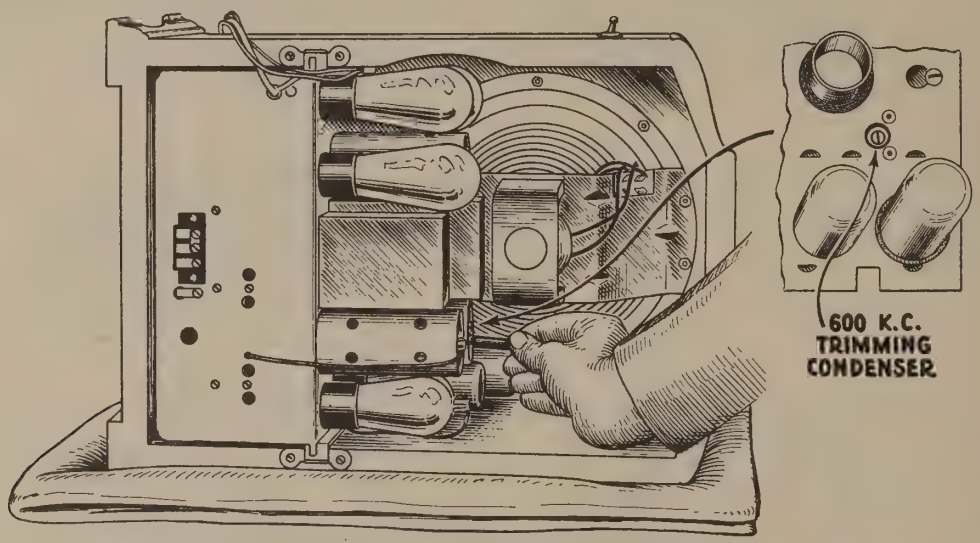


Figure 9—Adjusting 600 K. C. Oscillator Trimming Condensers
(Laying instrument on side is necessary to provide accessibility to all adjustments)

(8) OSCILLATION

Oscillation in the R. F. or I. F. stages may be due to:

(a) Failure of shielding of Radiotrons or their control grid leads not in place. Make sure all shielding and leads are as originally intended. Any failure should be repaired.

(b) Open by-pass condensers in receiver assembly. Key No. 15, page 8. Test and make any repair or replacement necessary.

(c) Ungrounded power line. Try connecting the ground to both the chassis and the ground lead.

MAKE FOLLOWING ADJUSTMENTS ONLY AFTER CHECKING ALL OTHER POSSIBILITIES FOR TROUBLE

(9) R. F. LINE-UP AND OSCILLATOR TRIMMING CONDENSER ADJUSTMENTS

Four adjustable condensers are provided for aligning the R. F. circuits and adjusting the oscillator frequency so that it will be at a 175 K. C. difference from the incoming R. F. signal throughout the tuning range of the set. Poor quality, insensitivity and possible inoperation of the receiver may be caused by these condensers being out of adjustment.

If the other adjustments have not been tampered with—the intermediate tuning condensers—the following procedure may be used for adjusting these condensers.

(a) Procure an R. F. oscillator giving a modulated signal at exactly 1400 K. C. and 600 K. C. The RCA Victor oscillator No. A6004, listed in the replacement parts list or the General Radio, Type 320 or Type 360 may be used. Also procure a non-metallic screw driver (Stock No. A6000) and a small socket wrench (Stock No. A6001). Both of these articles are listed in the replacement parts list in Part I of this book.

(b) An output indicator is necessary. This may be a current squared thermo-galvanometer connected to the secondary of the output transformer instead of the cone coil of the reproducer unit, a 0–5 milliameter connected in series with the plate supply to the second detector or a low range A. C. voltmeter connected across the reproducer unit cone coil.

(c) Turn the station selector until the dial reads exactly 100. Then remove the chassis from the cabinet, being careful not to disturb the setting of the dial. The gang condenser rotor plates should be fully meshed with the stator plates. If not, then the dial drum must be adjusted until such a condition exists. Be sure and tighten the set screws that hold the drum to the condenser shaft. A suitable socket wrench for making this adjustment is listed in Part I.

(d) Place the oscillator in operation at exactly 1400 K. C. and couple it to the antenna. Set the dial scale at 11 and turn the cabinet on its side. Place a soft pad under the instrument to prevent damage to the cabinet finish. Adjust the coupling between the oscillator and antenna lead of the set or the volume control until a deflection is obtained in the output meter.

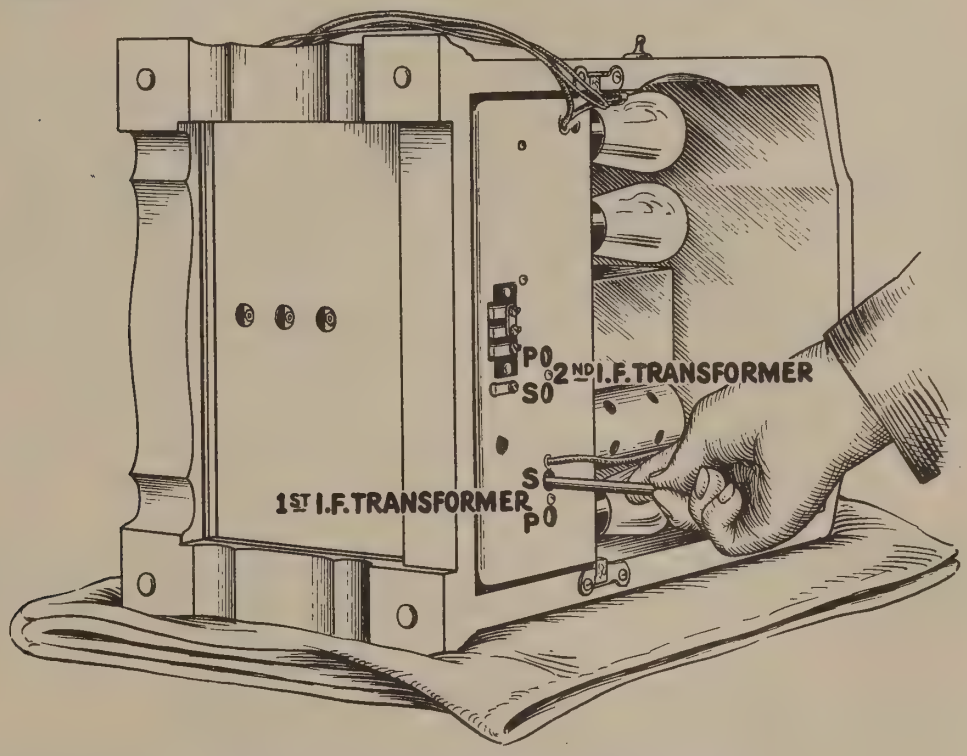


Figure 10—Adjusting I. F. Transformer Tuning Condenser

(e) With the socket wrench adjust the oscillator, first detector and R. F. line-up condensers until a maximum deflection is obtained in the output meter. (See Figure 8.) A suitable socket wrench for making this adjustment (Stock No. A6001), is listed in Part I.

(f) Set the oscillator at 600 K. C. Tune in this signal with the receiver and adjust for a deflection in the output meter. Now adjust the 600 K. C. series condenser, Figure 9, until maximum output has been obtained. Rock the gang condenser back and forth while making this adjustment. A suitable non-metallic screw driver is listed in Part I.

(g) Change the frequency of the oscillator to 1400 K. C. and set the dial at 11. Again make the adjustments given under (d) and (e).

So adjusted, the R. F. circuits are properly aligned and the oscillator will maintain a constant frequency difference from the incoming R. F. signal.

(10) I. F. TUNING CONDENSER ADJUSTMENTS

A single intermediate frequency amplifier stage is used in this receiver. Two transformers are used and all circuits are tuned to 175 K. C. The circuits are peaked and when alignment adjustments are made, the condensers are adjusted for maximum output.

A detailed procedure for making these adjustments follows:

(a) Procure a modulated R. F. oscillator giving a signal at 175 K. C. The General Radio, Type 360 oscillator or the Type 320 to which 175 K. C. has been added, may be used. A non-metallic screw driver is also necessary. A suitable screw driver is listed in Part I of this book. (Stock No. A6000.)

(b) Connect an output meter in the circuit. This may be a current squared thermo-galvanometer connected to the secondary of the output transformer instead of the reproducer unit cone coil, a 0–5 milliameter connected in series with the plate supply to the second detector or a low range A. C. voltmeter connected across the cone coil of the reproducer.

(c) Remove the oscillator tube, socket No. 2, and make a good ground connection to the chassis. Place the oscillator in operation and connect its output to the control grid cap of the first detector, socket No. 3. Adjust the oscillator output or the receiver volume control until a deflection is obtained in the output meter.

(d) Now adjust the secondary and primary of the second and first I. F. transformers until a maximum reading is obtained in the output meter. Go through these adjustments a second time as a slight readjustment may be necessary.

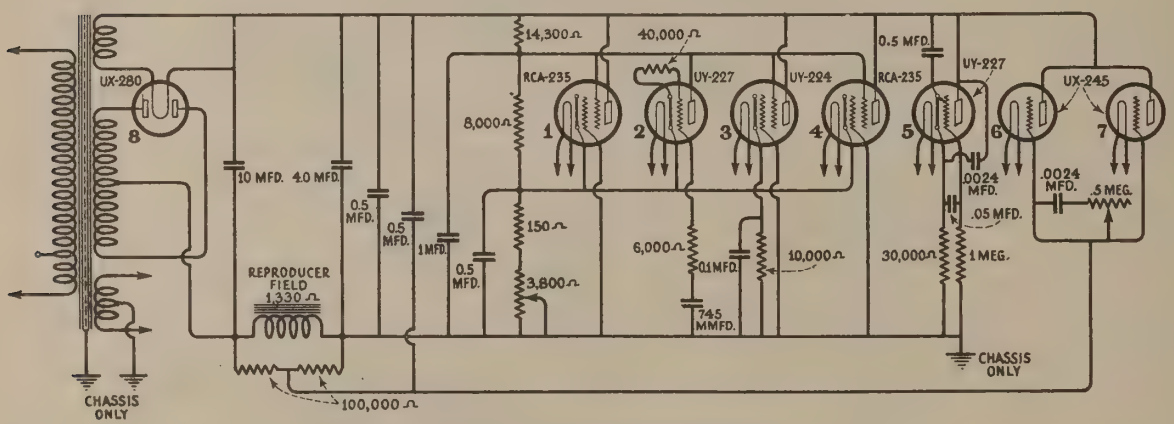


Figure 11—Schematic Diagram of Voltage Supply System.

When the adjustments are made, the set should perform at maximum efficiency. However, due to the interlocking of the adjustments, it is a good plan to follow the I. F. adjustments with the R. F. and oscillator line-up condenser adjustments. The correct method of doing this is given in Part III, Section 9.

(11) LINE-UP ADJUSTMENTS OF GANG CONDENSER

A three gang condenser is used in this instrument. The end plates of each unit are split into four sections that allow an exact adjustment for aligning the complete unit. Unless tampering has occurred, adjustments will not be necessary. However, if adjustments are necessary, the following procedure should be used.

(a) Remove the receiver assembly from the cabinet and place in a position convenient for work.

(b) Realign the I. F., oscillator and R. F. circuits as described in Part III, Sections 9 and 10. This must be done properly, otherwise subsequent adjustments cannot be properly made.

(c) A modulated oscillator, the frequency of which is continuously variable throughout the broadcast band is necessary. Also an output meter similar to those suggested in Part III, Sections 9 and 10 is necessary. Connect it in a similar manner in the circuit.

(d) Place the receiver in operation and turn the tuning condenser until the first section of the gang condenser end plates are fully meshed with the stator plates. Couple the output of the oscillator to the antenna system of the receiver and adjust its output frequency until a deflection is obtained in the output meter.

(e) Now bend the sections of the three end plates until an increased reading is obtained. If this is not possible, or if mechanical clearance from the stator plates cannot be obtained, an adjustment is not necessary.

(f) Turn the tuning condenser until the first and second sections of the rotor end plates are engaged with the stator plates. Shift the oscillator frequency until a deflection is obtained in the output meter. Then bend the second set of sections for a maximum deflection in the output meter at the same time maintaining mechanical clearance.

(g) Repeat this procedure until maximum output is obtained at all sections of the rotor plates. So adjusted, the condenser will be properly aligned.

PART IV—ELECTRICAL TESTS

(1) VOLTAGE SUPPLY SYSTEM

Figure 11 illustrates the schematic diagram showing the voltage supply system together with the values of the various resistors. It will be noted that the series method of voltage supply is used except in the volume control circuit. This keeps the current drain on the rectifier tube at a minimum value.

(2) VOLTAGE READING SERVICE DATA CHART

The service data chart on page 18 provides a means of diagnosing trouble from socket voltage readings taken at Radiotron sockets with any of the usual set analyzers. A set of readings taken from the receiver under consideration checked against this chart will quickly disclose the cause of most difficulties.

(3) VOLTAGE READINGS AT RADIOTRON SOCKETS

The following voltages taken at each Radiotron socket with the receiver in operating condition should prove of value when checking with test sets such as the Weston Model 547, Type 3, or others giving similar readings. The plate currents shown are not necessarily accurate for each tube, as the cable in the test set will cause some circuits to oscillate, due to its added capacity. Small variations of voltages will be caused by different tubes and line voltages. Therefore, the following values must be taken as approximately those that will be found under varying conditions. The numbers in column 1 indicate the tube socket numbers shown in Figure 12.

RADIOTRON SOCKET VOLTAGES
120 VOLT LINE

Tube No.	Cathode to Heater Volts, D. C.	Cathode or Filament to Control Grid Volts, D. C.	Cathode to Screen Grid Volts, D. C.	Cathode or Filament to Plate Volts, D. C.	Plate Current M. A.	Screen Grid Current M. A.	Heater or Filament Volts, A. C.
VOLUME CONTROL AT MINIMUM							
1	40	40	55	200	0	0	2.4
2	40	0	—	50	4.0	—	2.4
3	8.0	7.0	90	240	0.5	0.25	2.4
4	40	40	55	200	0	0	2.4
5	25	*5.0	—	220	0.5	—	2.4
6	—	*30.0	—	245	30.0	—	2.4
7	—	*30.0	—	245	30.0	—	2.4
VOLUME CONTROL AT MAXIMUM							
1	3.5	3.5	70	240	5.0	**0.7	2.4
2	2.5	0	—	65	5.5	—	2.4
3	5.0	5.0	70	235	0.5	0.25	2.4
4	3.5	3.5	70	240	5.0	**0.7	2.4
5	25	*5.0	—	220	0.5	—	2.4
6	—	*30	—	245	25.0	—	2.4
7	—	*30	—	245	25.0	—	2.4

*Not true reading due to resistance in circuit.
**This reading may be + or — depending on age of tube.

VOLTAGE READING SERVICE DATA CHART

VOLUME CONTROL AT MAXIMUM

VOLTAGE CHARACTERISTICS	1 R. F.				2 OSC.			3 1st DET.				4 I. F.				5 2nd DET.			6 PWR. A. F.			7 PWR. A. F.			CAUSE OF INCORRECT READING
	C. G. Volts	S. G. Volts	Plate Volts	Plate M. A.	Grid Volts	Plate Volts	Plate M. A.	C. G. Volts	S. G. Volts	Plate Volts	Plate M. A.	C. G. Volts	S. G. Volts	Plate Volts	Plate M. A.	Grid Volts	Plate Volts	Plate M. A.	Grid Volts	Plate Volts	Plate M. A.	Grid Volts	Plate Volts	Plate M. A.	
Normal	3.5	70	240	5.0	0	65	5.5	5.0	70	235	0.5	3.5	70	240	5.0	5.0	220	0.5	30	245	25	30	245	25	
No C. G. Voltage on Tube No. 1	0	70	240	9.0	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	Open Secondary of R. F. Transformer L-2
No C. G. Voltage on Tube No. 3	....	....	....	....	....	....	....	0	70	235	1.5	....	....	....	....	....	....	....	....	....	....	....	....	....	Open 1st Det. Grid Coil L-5
No C. G. Voltage on Tube No. 4	....	....	....	....	....	....	....	....	....	....	....	0	70	240	9.0	....	....	....	....	....	....	....	....	....	Open Secondary of 1st I. F. Transformer L-7
No C. G. and Low Plate Voltage on Tube No. 5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	70	5.5	....	....	....	....	....	....	Open Sec. of 2nd I. F. Trans. L-9 or 1 Meg. Res. R-9
Low Voltages on All Tubes	2.0	35	150	2.5	0	35	3.0	3.0	35	140	0.5	2.0	35	150	2.5	5.0	100	0.25	0	140	80	30	150	0	Open One-Half Secondary of Interstage Transformer T-2
Low Voltages on All Tubes	2.0	35	150	2.5	0	35	3.0	3.0	35	140	0.5	2.0	35	150	2.5	5.0	100	0.25	30	150	0	0	140	80	Open One-Half Secondary of Interstage Transformer T-2
No Voltages on Tube No. 2	....	....	....	....	0	0	0	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	Open Oscillator Plate Coil L-10
No Plate Voltage on Tube No. 1	3.5	60	0	0	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	Open R. F. Plate Coil L-4
No Plate Voltage on Tube No. 3	....	....	....	....	....	....	....	4.0	70	0	0	....	....	....	....	....	....	....	....	....	....	....	....	....	Open Primary of 1st I. F. Transformer L-6
No Plate Voltage on Tube No. 4	....	....	....	....	....	....	....	....	....	....	....	3.5	60	0	0	....	....	....	....	....	....	....	....	....	Open Primary of 2nd I. F. Transformer L-8
No Voltages on Tube No. 5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	0	....	....	....	....	....	....	Open R. F. Choke L-13 or Primary of Transformer T-2
No Plate Voltage on Tube No. 6	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	20	0	0	....	....	....	Open One-Half Primary of Output Transformer T-3
No Plate Voltage on Tube No. 7	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	20	0	0	Open One-Half Primary of Output Transformer T-3
No C. G. Voltage on Tubes Nos. 1 and 4	0	70	240	9.0	....	....	....	....	....	....	....	0	70	240	9.0	....	....	....	....	....	....	....	....	....	Shorted 0.5 Mfd. Condenser C-13
No C. G. Voltage on Tube No. 3	..	....	....	....	....	....	....	0	70	240	4.0	....	....	....	....	....	....	....	....	....	....	....	....	....	Shorted 0.1 Mfd. Condenser C-15
No C. G. or S. G. Voltages on Tubes Nos. 1, 2, 3 or 4	0	0	240	0	0	0	0	0	0	235	0	0	0	240	0	....	....	....	....	....	....	....	....	....	Shorted 1.0 Mfd. Condenser C-16
Low Voltages on All Tubes	1.0	20	100	1.0	0	20	1.5	1.0	20	100	0.25	1.0	20	100	1.0	5	60	0.5	+8	80	50	+8	80	50	Shorted 0.5 Mfd. Condenser C-24
No. C. G. Voltage on Tube No. 5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	180	30	....	....	....	....	....	....	Shorted 0.5 Mfd. Condenser C-12
Low Plate Voltage on Tube No. 5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	60	1.5	....	....	....	....	....	....	Shorted 0.05 Mfd. Condenser C-23
No Plate Voltage on Tube No. 5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	25	0	0	....	....	....	....	....	....	Shorted .0024 Mfd. Condenser C-11
Low Plate M. A. on Tubes Nos. 6 and 7	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	50	260	10.0	50	260	10.0	Shorted 100,000 Ohm Resistor R-10
Low Voltages on All Tubes	1.5	25	100	0.25	0	25	0.5	1.5	25	100	0.25	1.5	25	100	0.5	5.0	100	0.25	0	100	40	0	100	40	Shorted 100,000 Ohm Resistor R-11
High C. G. Voltage on Tubes Nos. 1 and 4	200	0	0	0	0	0	0	20	200	215	0	200	0	0	0	....	....	....	....	....	....	....	....	....	Open Volume Control R-2 or 150 Ohm Resistor R-3
High S. G. Voltages	7.0	160	210	25	0	100	12	14	160	200	2.0	7.0	160	210	25	....	....	....	....	....	....	....	....	....	Open 8,000 Ohm Resistor R-1
No C. G. or S. G. Voltage on Tubes Nos. 1, 2, 3 and 4	0	0	250	0	0	0	0	0	0	240	0	0	0	250	0	....	....	....	....	....	....	....	....	....	Open 14,300 Ohm Resistor R-4
No Voltages on Tube No. 3	....	....	....	....	....	....	....	0	0	0	0	....	....	....	....	....	....	....	....	....	....	....	....	....	Open 10,000 Ohm Resistor R-5
No Plate Voltage on Tube No. 5	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	20	0	0	....	....	....	....	....	....	Open 30,000 Ohm Resistor R-8

(4) CONTINUITY TESTS

The tests on page 21 show complete continuity for the receiver assembly and socket power unit of this instrument. Disconnect the antenna and ground leads and the A. C. supply cord at its outlet.

A pair of headphones with at least 4½ volts in series, a voltmeter with sufficient battery to give a good deflection when connected across the battery terminals, or a direct reading "Ohmmeter" should be used in making these tests.

Socket No.	Radiotron Type
1	RCA-235
2	UY-227
3	UY-224
4	RCA-235
5	UY-227
6	UX-245
7	UX-245
8	UX-280

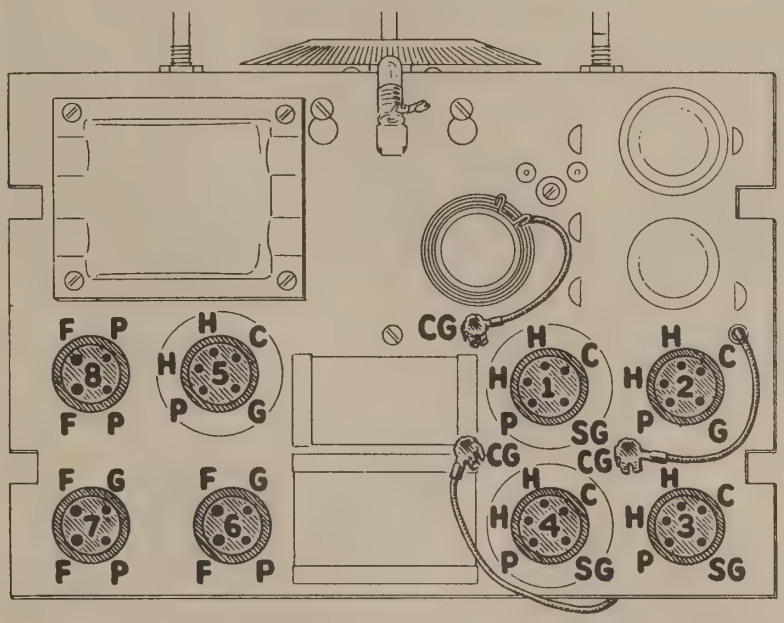


Figure 12—Socket Location and Contact Position

The resistance of the various circuits is shown in the column titled "Correct Effect." Checking the resistance of the circuits adds an additional check on their correct functioning. This may be done by means of a direct reading "Ohmmeter," a resistance bridge, the voltmeter-ammeter method or the method suggested in Part IV, Section 6.

The Radiotron sockets, numbers, contacts and terminals used in making these tests are shown in Figure 12. Reference to Figure 13, will be helpful while making these tests. The wiring diagram is shown in Figure 14.

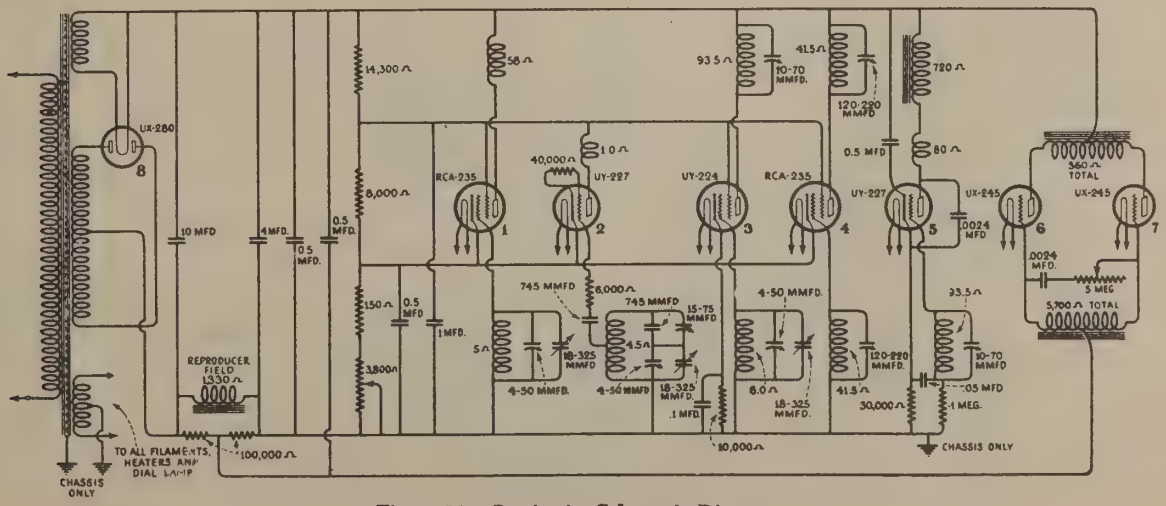


Figure 13—Continuity Schematic Diagram

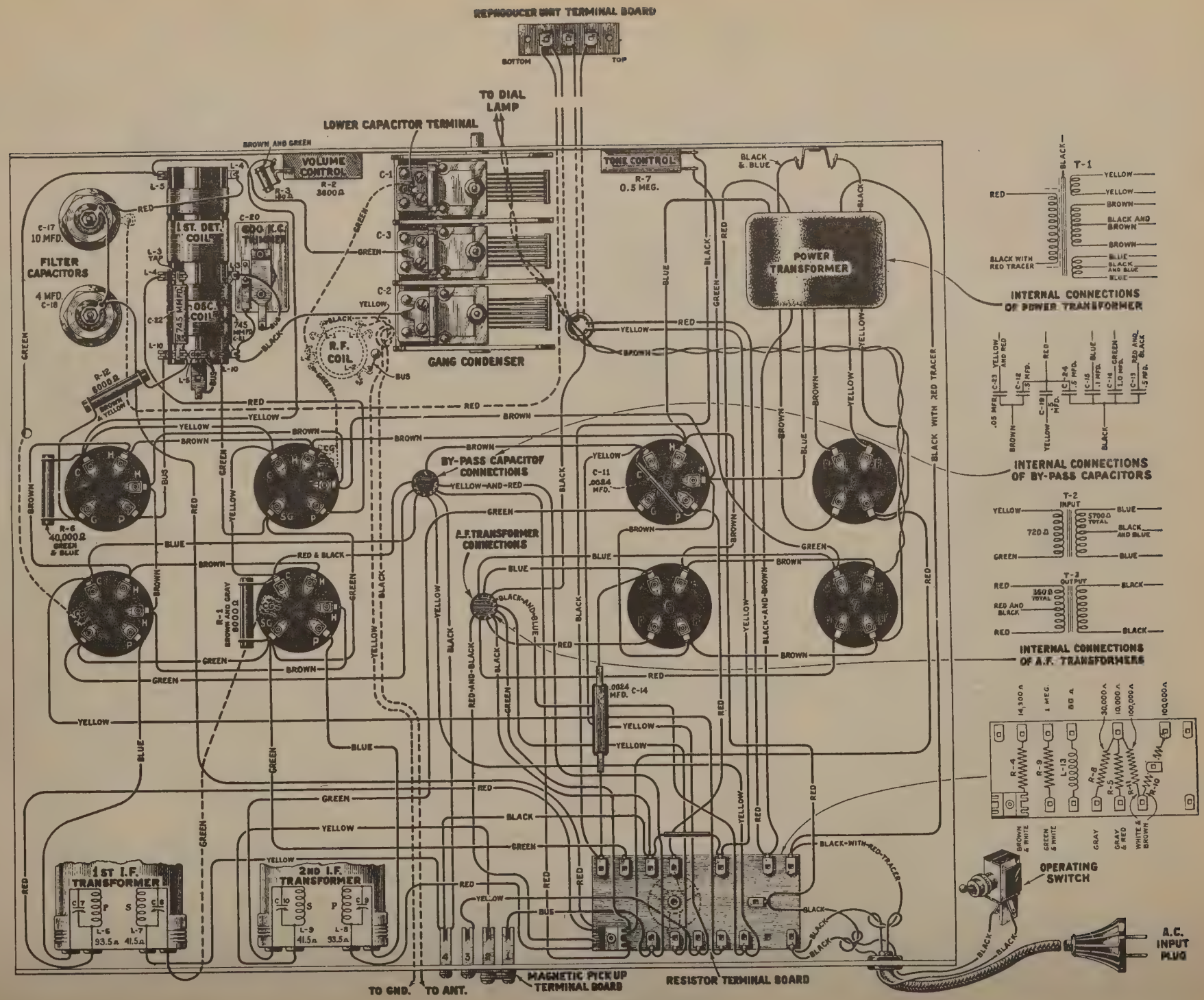


Figure 14—Wiring Diagram

CONTINUITY TESTS

VOLUME CONTROL AT MAXIMUM

DISCONNECT 4 MFD. AND 10 MFD. CONDENSERS BEFORE MAKING FOLLOWING TESTS

TERMINALS	CORRECT EFFECT	INCORRECT EFFECT	
		Indication	Caused By
Antenna lead to ground lead	Closed (40 ohms)	Open	Open antenna coupling coil
C1, 2 or 4 to gnd. (Vol. Cont. at "Minimum")	Closed (3950 ohms)	Open Short	Open 150 ohm resistor Shorted .5 mfd. condenser
C1, 2 or 4 to Gnd. (Vol. Cont. at "Maximum")	Closed (150 ohms)	Open Short	Open volume control or 150 ohm resistor Shorted .5 mfd. condenser.
CG1 to Gnd.	Closed (5 ohms)	Open Short	Open grid coil of R. F. tube Shorted tuning or line-up condenser
SG 1, 3, 4 or P2 to Gnd.	Closed (8150 ohms)	Open Short	Open 8000 ohm or 150 ohm resistor Shorted 1 mfd. condenser
P1 to Gnd.	Closed (22,508 ohms)	Open 58 ohms 14,358 ohms 22,358 ohms	Open R. F. plate coil, 14300 ohm resistor, 8000 ohm resistor or 150 ohm resistor Shorted 4.0 mfd. or 0.5 mfd. condenser Shorted 1 mfd. condenser Shorted .5 mfd. condenser
CG2 to C2	Closed (40,000 ohms)	Open	Open 40,000 ohm resistor
P2 to Gnd.	Closed (8,151 ohms)	Open 1 ohm 8,001 ohms	Open 8,000 ohm resistor or 150 ohm resistor Shorted 1 mfd. condenser Shorted .5 mfd. condenser
C3 to Gnd.	Closed (10,000 ohms)	Open Short	Open 10,000 ohm resistor Shorted .1 mfd. condenser
CG3 to Gnd.	Closed (6.0 ohms)	Open Short	Open 1st detector grid coil Shorted 1st detector tuning or line-up condenser
P3 to Gnd.	Closed (22,543.5 ohms)	Open 22,450 ohms 93.5 ohms 14,393.5 ohms 22,393.5 ohms	Open primary of 1st I.F. transformer, 14,300 ohm resistor, 8,000 ohm resistor or 150 ohm resistor Shorted primary tuning condenser of 1st I.F. transformer. Shorted 4 mfd. or .5 mfd. condenser Shorted 1 mfd. condenser Shorted .5 mfd. condenser
CG4 to Gnd.	Closed (41.5 ohms)	Open Short	Open secondary of 1st I.F. transformer Shorted secondary tuning condenser of 1st I.F. transformer
P4 to Gnd.	Closed (22,491.5 ohms)	Open 22,450 ohms 41.5 ohms 14,341.5 ohms 22,341.5 ohms	Open primary of 2nd I.F. transformer, 14,300 ohm resistor, 8000 ohm resistor or 150 ohm resistor Shorted primary tuning condenser of 2nd I.F. transformer Shorted 4 mfd. or .5 mfd. condenser Shorted 1 mfd. condenser Shorted .5 mfd. condenser
C5 to Gnd	Closed (30,000 ohms)	Open	Open 30,000 ohm resistor
C5 to CG5	Closed (1,030,093.5 ohms)	Open Short	Open 30,000 ohm resistor and 1 meg. resistor Shorted .05 condenser
C5 to P5	Closed (53,250 ohms)	Closed (800 ohms) Short	Shorted .5 mfd. condenser Shorted .0024 mfd. condenser
CG5 to Gnd.	Closed (1 meg.)	Open Closed (30,000 ohms)	Open 1 meg. resistor Shorted .05 mfd.

CONTINUITY TESTS—Continued
VOLUME CONTROL AT MAXIMUM

TERMINALS	CORRECT EFFECT	INCORRECT EFFECT	
		Indication	Caused By
P5 to Gnd.	Closed (23,250 ohms)	Open	Open R.F. choke, primary of A.F. transformer, 14,300 ohm resistor, 8000 ohm resistor or 150 ohm resistor
		800 ohms	Shorted 4 mfd. or .5 mfd. condenser
		15,100 ohms	Shorted 1 mfd. condenser
		23,100 ohms	Shorted .5 mfd. condenser
G6 to G7	Closed (5700 ohms)	Open	Open secondary of interstage transformer
		Short	Shorted .0024 mfd. condenser
P6 to P7	Closed (360 ohms)	Open	Open primary of output transformer
P8 to P8	Closed (250 ohms)	Open	Open UX-280 plate winding of power transformer
P8 to Gnd.	Closed (1455 ohms)	Open	Open field coil of reproducer or UX-280 plate winding
Across A.C. input plug	Closed	Open	Open primary of power transformer

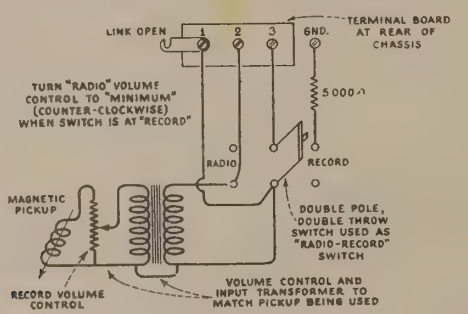


Figure 15—Connections for Attaching Magnetic Pick-up

(5) TESTING CONDENSERS

The by-pass condensers are in a metal container. The internal wiring diagram is shown in Figure 14.

The condensers can best be tested by freeing their connections and charging them with approximately 200 volts D. C. and then noting their ability to hold the charge. After charging, short circuiting the condenser terminals with a screw driver should produce a flash, the size of the flash depending on the capacity of the condenser and the voltage used for charging. A condenser that will not hold its charge is defective and requires replacement of the entire unit.

The electrolytic condensers can best be tested by measuring their leakage current. This should not exceed 2.4 M.A. for the 10 Mfd. condenser and 1.0 M.A. for the 4 Mfd. condenser, both measured with 400 D. C. volts applied across the condenser terminals.

(6) CHECKING RESISTANCE VALUES

The values of the various resistance units in this receiver are shown in the schematic diagram Figure 2. When testing a receiver for defects the various values of resistance should be checked. This may be done by a resistance bridge; the voltmeter-ammeter method, or by the following method.

For resistances of low value, 5000 ohms or less, use a voltmeter having a resistance not greater than 100 ohms per volt. For high values of resistance use a meter of 1000 ohms or more per volt. The Weston Meters, Type 301 or 280, each have a resistance of 62 ohms per volt and are satisfactory for the low values. Use sufficient battery to give a good deflection on the meter, for example, a 45 volt "B" battery for a 0–50 voltmeter. Take two readings, one of the battery alone, and one of the battery with the unknown resistance in series. Then apply the following formula:

$$\left(\frac{\text{Reading obtained of battery alone}}{\text{Reading obtained with resistance in series}} - 1 \right) \cdot \text{Resistance of meter} = \text{Unknown Resistance}$$

(7) MAGNETIC PICKUP CONNECTIONS

Figure 15 shows the proper connections for attaching a magnetic pickup to RCA Victor Radiola Superette.

PART V—MAKING REPLACEMENTS

The various parts and assemblies of this receiver are easy of access, and replacement is comparatively simple.

(1) REMOVING CHASSIS FROM CABINET

To remove the chassis from the cabinet, proceed as follows:

(a) Remove the three control knobs on the front of the cabinet. These are of the set screw type.

(b) Unsolder the leads that connect the chassis to the loudspeaker terminal board.

(c) Remove the four screws that hold the rubber chassis supports in place. Also release the operating switch and its leads from the side of the cabinet.

(d) The chassis together with its rubber supports and their holders may be pulled clear and placed in a position convenient for work. A reversal of the above procedure may be used to replace the chassis in the cabinet.

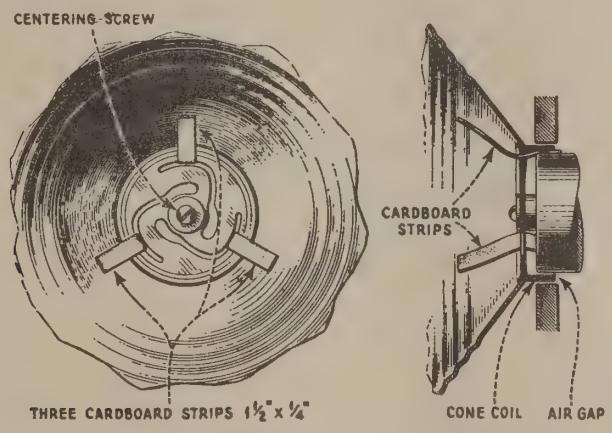


Figure 16—View of Strips in Place for Centering Cone

(2) REPLACING REPRODUCER CONE

Should replacement of the reproducer cone be necessary, proceed as follows:

(a) Remove the chassis from the cabinet as described in Part V, Section 1.

(b) Supporting the reproducer with one hand, remove the four screws, nuts and lock washers that hold it in place. Be careful not to mar the heads of these screws.

(c) Remove the six nuts, screws and lock washers that hold the metal ring and cone edge in place. Remove the cone centering screw. The cone coil is connected by means of two soldered terminals located adjacent to the cone bracket. Unsolder these leads. The cone may now be removed.

(d) Place the new cone in the position occupied by the old one, and replace cone ring, the ten screws, nuts and the lock washers. Do not tighten the screws.

(e) Place three pieces of cardboard the thickness of a visiting card and approximately 1½" x ¼" in size in the space between the inside of the cone coil and the pole piece. See Figure 16.

(f) Now replace the cone centering screw and tighten.

(g) Tighten the six screws that hold the cone edge.

(h) Remove the pieces of cardboard and solder the cone coil leads in place.

The unit may now be returned to the cabinet and the chassis replaced in the cabinet.

S. O. 7680. 15M—4-14-'31.

Service Notes

for

RCA Victor Radiola Superette R-7A

The RCA Victor Superette R-7A is an eight tube screen grid Super-Heterodyne similar to the R-7 with the exception that the new Pentode Radiotrons, RCA-247 are used in the push-pull output stage instead of Radiotrons UX-245. Use of these tubes, with their associated circuits, results in greater sensitivity, greater power and better tone quality.

Referring to Figure 1, the schematic circuit diagram, the audio circuit functions in the following manner:

The output of the detector is coupled to the grids of the Radiotrons RCA-247 through an audio transformer. Shunted across the secondary of this transformer are two 0.0004 mfd. condensers, connected in series with the center connection grounded. The purpose of these two condensers is to prevent any audio oscillation and to provide a high frequency cut-off for the stage. Also across the secondary of the input transformer is shunted the resistor and capacitor that constitutes the tone control. This is a 200,000 ohm variable resistor and a 0.008 mfd. condenser connected in series. The tone control functions to reduce the high frequency output as the resistance is decreased. At the extreme low position, the condenser and secondary of the A. F. transformer resonates at a low frequency and thereby accentuates the bass response. A 0.005 mfd. condenser connected in series with a 10,000 ohm resistor is placed across the primary of the output transformer. This functions to reduce the third harmonic distortion, an inherent characteristic of the Pentode tube. The bias voltage for Radiotrons RCA-247 is obtained by using a portion of the drop across the reproducer field. One 160,000 ohm and one 40,000 ohm resistor act as voltage dividers.

SERVICE DATA

Figure 1 shows the schematic diagram and Figure 2 the wiring diagram. The voltage readings are shown on the reverse side and the replacement parts below.

Reference to the RCA Victor Radiola Superett Service Notes should be used for servic data applying to the R. F., oscillator and I. F. stages as well as general service data on this type of receiver.

REPLACEMENT PARTS

Part No.	DESCRIPTION	List Price
2563	Resistor—6,000 ohms—Carbon type—Package of 5	$3.00
2734	Capacitor—745 mmfd.—Package of 5	2.20
2745	Screw—Adjusting condenser screw—Package of 10	.50
2746	Socket—Dial lamp socket	.50
2747	Cap—Grid connector cap—Package of 5	.50
2749	Capacitor—2400 mmfd.	1.50
2875	Knob—Tuning, volume control or tone control knob—Package of 5	1.50
2881	Bracket—Dial lamp bracket—Package of 5	.50
2882	Socket—UY Radiotron socket—7 used	.50
2957	Capacitor—10 mfd. electrolytic capacitor	3.00
2963	Resistor—8,000 ohm carbon type—Package of 5	2.50
2968	Socket—UX Radiotron socket—1 used	.50
2973	Board—Magnetic pickup terminal board	.50
2991	Transformer—First intermediate transformer	3.00
2992	Transformer—Second intermediate transformer	3.00
2994	Coil—Second detector plate coil complete with mounting rivet	.60
2995	Volume control—Complete less knob—Package of 5	6.00
2997	Coil—R. F. coil—Complete with mounting washers and nuts	1.90
2998	Coil—Detector and oscillator coil—Complete with mounting washers and nuts	2.40
2999	Drive shaft—Dial drive shaft with mounting screws and washers	.50
3000	Scale—Dial scale and drum with set screws	.60
3003	Cushion—Sponge rubber chassis support cushions—One set of 4	.50
3005	Screw assembly—Speaker mounting screw assembly—Comprising one set of 4 screws, 4 eyelets, 4 nuts and 4 washers	.50
3020	Escutcheon—Station selector escutcheon complete with 4 mounting screws	.60
3056	Shield—Radiotron shield—3 used—Package of 2	.50
3060	Resistor—40,000 ohm—Carbon type—Package of 5	2.50
3062	Board—Loudspeaker terminal board—Package of 3	$0.50
3076	Resistor—1 megohm—Carbon type—Package of 5	2.50
3077	Resistor—30,000 ohm—Carbon type—Package of 5	2.50
3078	Resistor—10,000 ohm—Carbon type—Package of 5	2.50
3079	Resistor—40,000 ohm—Carbon type—Package of 5	2.50
3080	Resistor—160,000 ohm—Carbon type—Package of 5	2.50
3081	Resistor—16,000 ohm—Carbon type	.60
3082	Board—Resistor board—Less resistors, coil and capacitor	1.00
3083	Tone control and switch—Tone control and operating switch—Complete less knob	1.60
3084	Capacitor—0.008 mfd.—For tone control	.70
3085	Capacitor—400 mmfd.	.60
7054	Cord—Power cord	1.00
7062	Capacitor—Adjustable oscillator trimming capacitor	1.00
7241	Capacitor—3 gang tuning capacitor	8.00
7242	Board—Baffle board and grille cloth	1.00
7255	Transformer—Interstage audio transformer	4.50
7256	Capacitor pack—By-pass capacitor pack	3.50
8559	Ring—Cone retaining ring	.80
8570	Shield—Intermediate transformer shield	.60
8601	Cone—Cone with voice coil—Package of 5	15.00
8653	Coil—Speaker field coil, core and cone support	5.00
8654	Transformer—Power transformer—220 volt, 50–60 cycle	11.00
8679	Transformer—Power transformer—105–125 volt, 50–60 cycle	9.00
8680	Transformer—Power transformer—105–125 volt, 25–40 cycle	12.00
9323	Speaker—Loudspeaker complete	8.70
9351	Receiver—Receiver assembly—105–125 volt, 50–60 cycle	40.00
9353	Cabinet—Completewith grille cloth and baffle board	15.00

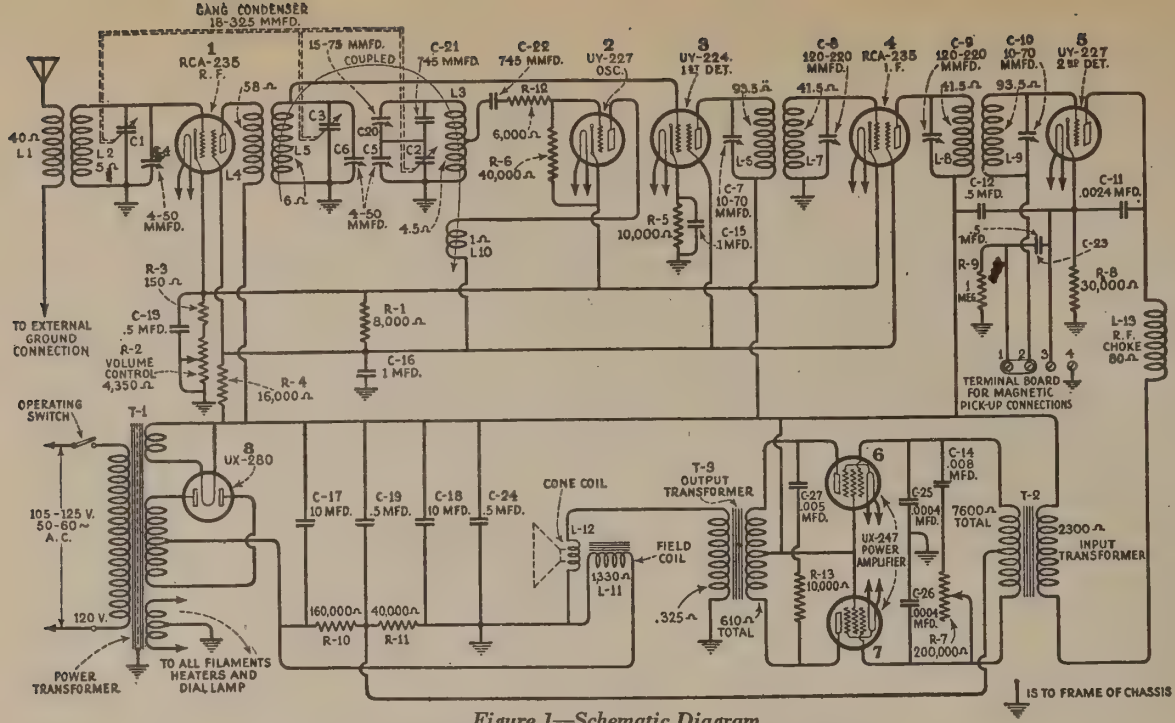


Figure 1—Schematic Diagram

RADIOTRON SOCKET VOLTAGES—110 VOLT A. C. LINE

Radiotron No.	Cathode to Heater Volts D. C.	Cathode or Filament to Control Grid Volts D. C.	Cathode to Screen Grid Volts D. C.	Cathode or Filament to Plate Volts D.C.	Plate Current M. A.	Heater or Filament Volts A. C.	Radiotron No.	Cathode to Heater Volts D. C.	Cathode or Filament to Control Grid Volts D. C.	Cathode to Screen Grid Volts D. C.	Cathode or Filament to Plate Volts D.C.	Plate Current M. A.	Heater or Filament Volts A. C.
VOLUME CONTROL AT MINIMUM							**VOLUME CONTROL AT MAXIMUM**						
1	38	35	50	200	.0	2.2	1	2.0	2.5	60	235	3.5	2.2
2	38	0	—	50	3.5	2.2	2	2.0	.0	—	50	4.5	2.2
3	7	6	80	235	0.5	2.2	3	4.0	4.0	55	230	0.5	2.2
4	38	35	50	200	.0	2.2	4	2.0	2.5	58	235	3.5	2.2
5	22	8	—	210	0.7	2.2	5	22	8	—	210	0.7	2.2
6	—	12	225	220	30	2.2	6	—	12	225	220	30	2.2
7	—	12	225	220	30	2.2	7	—	12	225	220	30	2.2

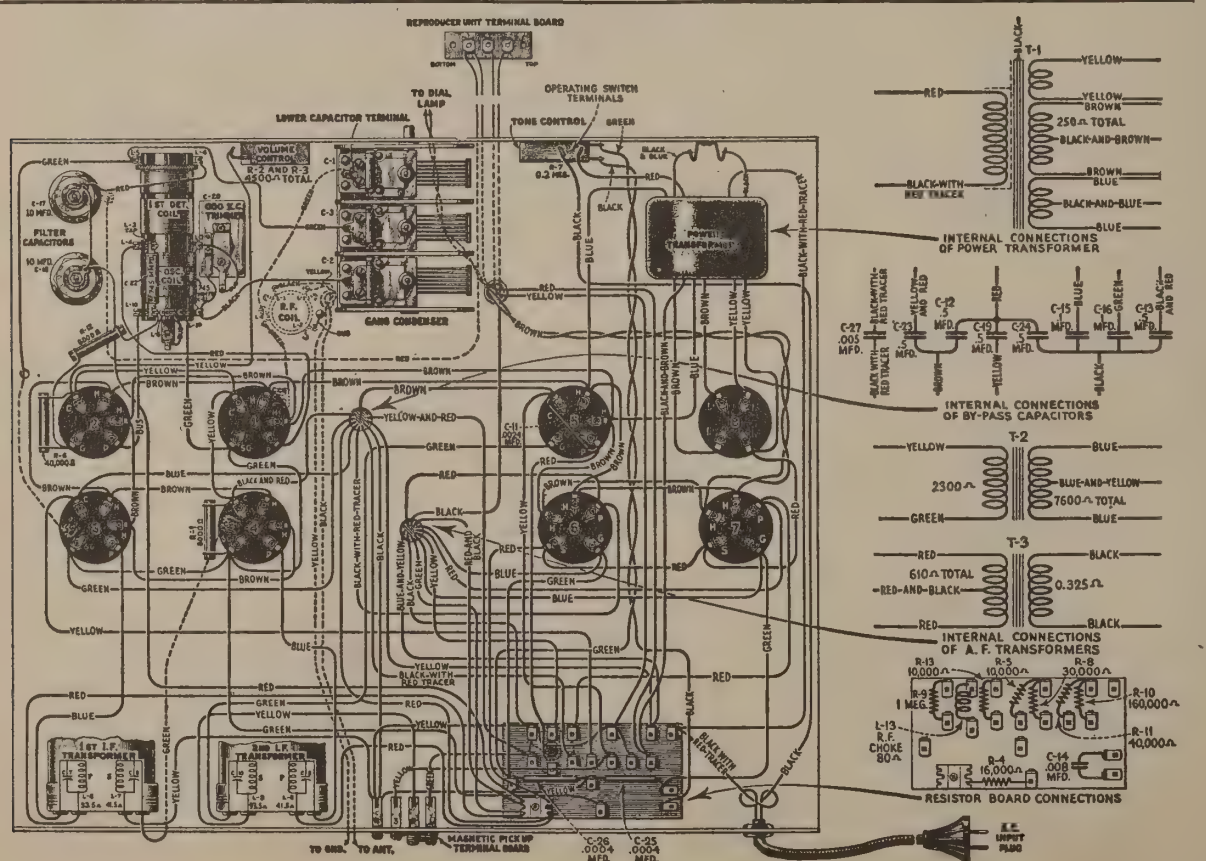


Figure 2—Wiring Diagram

Service Division, RCAVictor Company, Inc., Camden, N. J.

SERVICE NOTES
for
RCA Model R-7-LW

ELECTRICAL SPECIFICATIONS

Voltage Rating	100-230 Volts
Frequency Rating	40-60 Cycles
Power Consumption	100 Watts
Antenna Length	25-75 Feet
Circuit	A.C. Screen Grid Super-Heterodyne
Radiotrons	2 RCA-235, 1 UY-224, 2 UY-227, 2 UX-245, 1 UX-280 Total of 8
Radio Frequency Stages	One
First Detector	Tuned Input Grid Bias
Intermediate Stages	One
Second Detector	Power Grid Bias
Audio Stages	One (Push-Pull)
Rectifier	Full Wave UX-280
Loudspeaker	Dynamic
Undistorted Output	3.0 Watts
Frequency Range	550-1500 K.C. and 150-300 K.C.

PHYSICAL SPECIFICATIONS

Height	19 inches
Depth	10 inches
Width	14 inches
Weight alone	37 pounds
Weight (Packed for Shipment)	44 pounds
Packing Case Dimensions	16¾" x 12⅞" x 23¼"

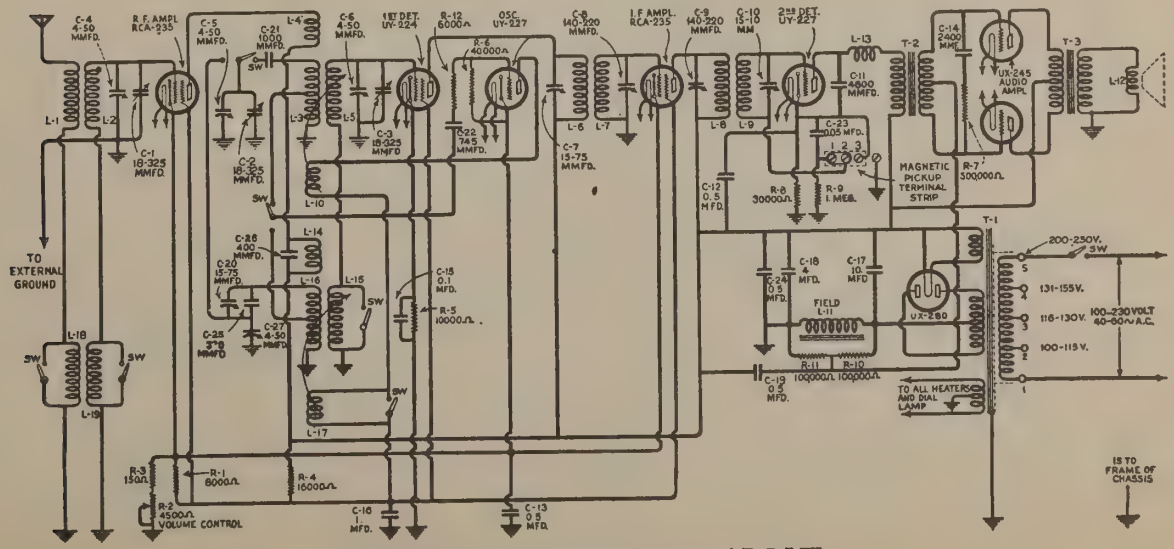


Figure 1—Schematic circuit diagram of R-7-LW

INTRODUCTION

The RCA Model R-7-LW is an eight tube screen grid Super-Heterodyne Receiver incorporating all the features inherent in this circuit and with the additional feature of covering two frequency bands. By means of a Selector Switch the tuning range may be changed from the broadcast range—550 to 1500 K.C.—to the intermediate range of 150 to 300 K.C. The entire mechanism is of compact construction and mounted on a table model cabinet of pleasing design.

SERVICE DATA

A reference to the RCA Superette Model R-7 Service Notes will give the details of the usual service work necessary with this type of receiver.

Figure 1 shows the schematic circuit diagram. Figure 2 shows the location of the various line-up capacitors. Figure 3 gives the correct connections for attaching a magnetic pickup to the R-7-L.W. and Figure 4 shows the wiring diagram. The voltage readings obtained at the Radiotron sockets with one of the usual set analyzers are given on page 3.

I. F. TRANSFORMER ALIGNMENT

A single intermediate frequency amplifier stage is used in this receiver. Two transformers are used and all circuits are tuned to 110 K.C. The circuits are peaked and when alignment adjustments are made, the condensers are adjusted for maximum output.

A detailed procedure for making these adjustments follows:

(a) Procure a modulated R. F. oscil lator giving a signal at 110 K.C. A non-metallic screw driver is also necessary. A suitable screw driver is listed in the Replacement Part List (Stock No. 7065).

(b) Connect an output meter in the circuit. This may be a current square thermo-galvanometer connected to the secondary of the output transformer instead of the reproducer unit cone coil, a 0-5 milliameter connected in series with the plate supply to the second detector or a low range A.C. voltmeter connected across the cone coil of the reproducer.

(c) Remove the oscillator tube, socket No. 2, and make a good ground connection to the chassis. Place the oscillator in operation and connect its output to the control grid cap of the first detector, socket No. 3. Adjust the oscillator output or the receiver volume control until a deflection is obtained in the output meter.

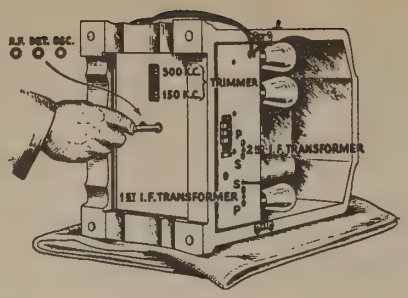


Figure 2—Location of various line-up capacitors

(d) Now adjust the secondary and primary of the second and first I.F. transformers until a maximum reading is obtained in the output meter. See Figure 2. Go through these adjustments a second time as a slight readjustment may be necessary.

When the adjustments are made, the set should perform at maximum efficiency. However, due to the interlocking of the adjustments, it is a good plan to follow the I.F. adjustments with R.F. and oscillator line-up condenser adjustments. The correct method of doing this is given in the following section.

OSCILLATOR ADJUSTMENTS

Five adjustable condensers are provided for aligning the R.F. circuits and adjusting the oscillator frequency so that it will be at a 110 K.C. difference from the incoming R.F. signal throughout the tuning range of the set. Poor quality, insensitivity, and possible inoperation of the receiver may be caused by these condensers being out of adjustment.

If the other adjustments have not been tampered with and are correctly aligned—the intermediate tuning condensers—the following procedure may be used for adjusting these condensers.

(a) Procure an R.F. oscillator giving a modulated signal at exactly 1400 K.C., 300 K.C. and 150 K.C. Also procure a non-metallic screw driver, such as Stock No. 7065 and a small socket wrench.

(b) An output indicator is necessary. This may be a current squared thermo-galvanometer connected to the secondary of the output transformer instead of the cone coil of the reproducer unit, a 0-5 milliameter connected in series with the plate supply to the second detector or a low range A.C. voltmeter connected across the reproducer unit cone coil.

(c) Turn the station selector until the dial reads exactly 100. Then remove the chassis from the cabinet, being careful not to disturb the setting of the dial. The gang condenser rotor plates should be fully meshed with the stator plates. If not, then the dial drum must be adjusted until such a condition exists. Be sure and tighten the set screws that hold the drum to the condenser shaft.

(d) Place the oscillator in operation at exactly 1400 K.C. and couple it to the antenna. Set the dial scale at 11 and turn the cabinet on its side. Place a soft pad under the instrument to prevent damage to the cabinet finish. Adjust the coupling between the oscillator and the antenna lead of the set or the volume control until a deflection is obtained in the output meter.

(e) With the socket wrench adjust the oscillator, first detector and R.F. line-up condensers until a maximum deflection is obtained in the output meter. (See Figure 2).

(f) Set the oscillator at 300 K.C. Set the Selector Switch to the right for the low frequency band and tune in this signal with the receiver. Adjust the Volume control for a deflection in the output meter. Now adjust the 300 K.C. condenser Figure 2 until maximum output has been obtained. Rock the gang condenser back and forth while making this adjustment.

(g) Set the oscillator at 150 K.C. and repeat as in (f) only adjust the 150 K.C. trimming condenser shown in Figure 2.

Change the frequency of the oscillator to 1400 K.C. and set the Dial at 11. Shift to the high frequency band. Again make the adjustment given under (d) and (e).

So adjusted, the R.F. circuits are properly aligned and the oscillator will maintain a constant frequency difference from the incoming R.F. signal.

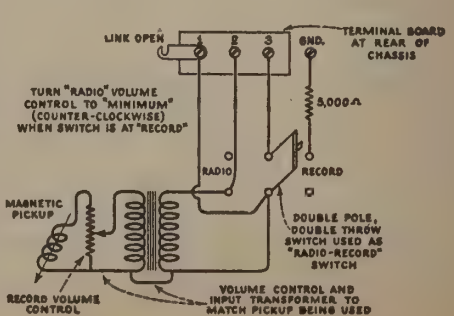


Figure 3—Magnetic Pickup Connections

RADIOTRON SOCKET VOLTAGES

Line Voltage correct for the transformer tap being used

These voltages are taken with the usual Set Analyzers and are not the true voltages at which the Radiotrons operate

Tube No.	Cathode to Heater Volts, D. C.	Cathode or Filament to Control Grid Volts, D. C.	Cathode to Screen Grid Volts, D. C.	Cathode or Filament to Plate Volts, D. C.	Plate Current M. A.	Screen Grid Current M. A.	Heater or Filament Volts, A. C.
VOLUME CONTROL AT MINIMUM							
1	40	40	55	200	0	0	2.4
2	40	0	—	50	4.0	—	2.4
3	8.0	7.0	90	240	0.5	0.25	2.4
4	40	40	55	200	0	0	2.4
5	25	*5.0	—	220	0.5	—	2.4
6	—	*30.0	—	245	30.0	—	2.4
7	—	*30.0	—	245	30.0	—	2.4
VOLUME CONTROL AT MAXIMUM							
1	3.5	3.5	70	240	5.0	**0.7	2.4
2	2.5	0	—	65	5.5	—	2.4
3	5.0	5.0	70	235	0.5	0.25	2.4
4	3.5	3.5	70	240	5.0	**0.7	2.4
5	25	*5.0	—	220	0.5	—	2.4
6	—	*30	—	245	25.0	—	2.4
7	—	*30	—	245	25.0	—	2.4

*Not true reading due to resistance in circuit.
**This reading may be + or — depending on age of tube.

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
	RECEIVER ASSEMBLY	
2240	Resistor—30,000 Ohms—Carbon type—Package of 1	$0.70
2546	Resistor—1,000,000 Ohms—Carbon type—Package of 5	3.00
2563	Resistor—6,000 Ohms—Carbon type—Package of 5	3.00
2731	Resistor—10,000 Ohms—Carbon type—Package of 5	2.00
2746	Socket—Dial lamp socket	.50
2747	Caps—Grid contactor caps—Package of 5	.50
2749	Capacitor—2400 MMFD	1.50
2875	Knobs—Station selector, band selector or volume control knob—Package of 5	1.50
2881	Bracket—Dial lamp bracket—Package of 5	.50
2882	Socket—UY Radiotron socket complete with insulator—5 used	.50
2957	Condenser—10 MFD Electrolytic condenser with mounting nut and washers	3.00
2963	Resistor—8,000 Ohms—Carbon type—Package of 5	2.50
2968	Socket—UX Radiotron socket complete with insulator—3 used	.50
2970	Resistor—500,000 Ohms—Carbon type—Package of 5	2.50
2973	Board—Magnetic pickup terminal board—Package of 2	.50
2994	Coil—2d detector R.F. choke coil	.60
2997	Coil—R.F. coil	1.90
2999	Shaft assembly—Dial scale drive shaft	.50
3000	Dial—Dial drum and scale complete	.60
3003	Cushions—Receiver chassis mounting cushions—Package of 4	.50
3006	Capacitor—1000 MMFD	.50
3056	Shield—Radiotron shield—3 used—Package of 2	.50
3057	Condenser—4 MFD. Electrolytic condenser with mounting nuts and washers	2.50
3058	Resistor—100,000 Ohms—Carbon type—Package of 5	2.50
3060	Resistor—40,000 Ohms—Carbon type—Package of 5	3.50
3061	Switch—Toggle type—Operating switch with mounting nut	.70
3081	Resistor—16,000 Ohms—Carbon type—Package of 1	.60
3085	Capacitor—400 MMFD	.60
3225	Lever—Switch lever—Package of 2	1.00
3226	Coil—Oscillator and 1st detector loading coil	1.25
3227	Coil—Antenna loading coal	$1.10
3228	Switch—Toggle switch for band changing	1.50
3230	Coil—1st detector and oscillator coil	3.00
3231	Control—Volume control—Complete with mounting nut	1.55
3232	Capacitor—280 MMFD—Package of 5	2.50
7054	Cord—Power cord	1.00
7062	Capacitor—Adjustable oscillator trimmer capacitor—15-70	1.00
7063	Capacitor—Adjustable trimmer capacitor 5-40	1.00
7065	Screwdriver—Non-metallic screwdriver for line-up adjustments	1.10
7238	Capacitor—Comprising four 0.5 MFD., one 0.05 MFD., one 0.1 MFD. and one 1.0 MFD. capacitors in metal container	3.50
7239	Transformer—Audio transformer assembly	6.00
7241	Capacitor—3 gang tuning condenser	8.00
7299	Capacitor—745 MMFD	.70
7336	Transformer—1st intermediate transformer	3.00
7337	Transformer—2d intermediate transformer	3.00
7338	Board—Resistor board complete less resistors and coil	1.00
7339	Switch—Rotary Band Selector switch—Complete with mounting nut and washers	1.90
8680	Transformer—Power transformer—105-125 volts—25-40 cycles	12.00
8768	Coil capacitor and switch—Complete with mounting nuts and escutcheon	9.00
8769	Transformer—Power transformer—100-230—40-60 cycles	12.50
	REPRODUCER	
8559	Ring—Cone retaining ring	.80
8601	Cone—Reproducer paper cone—Package of 5	15.00
8639	Coil—Reproducer field coil assembly—Comprising field coil, magnet and cone housing	5.00
	CABINET	
3005	Screw assembly—Reproducing mounting screws, nut and washers—Package of 1 set of 4 each	.50
3229	Escutcheon—Station selector escutcheon—Complete with mounting screws	.70
7242	Baffle board and grill cloth	1.00
9391	Cabinet—Cabinet complete less equipment	15.00

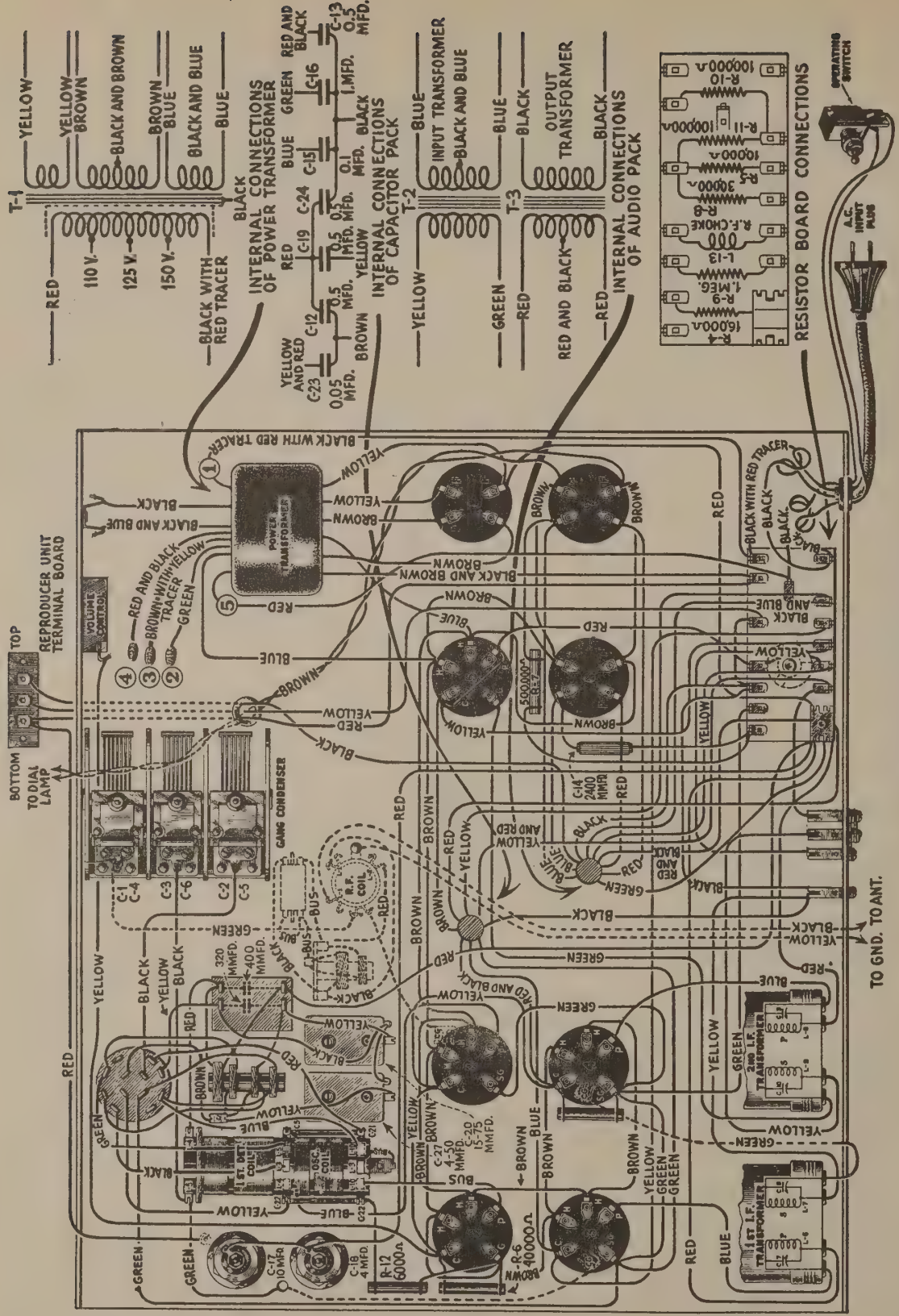


Figure 4—Wiring diagram of R-7-LW

International Division

RCA Victor Company, Inc.

Camden, N. J., U. S. A.

SERVICE NOTES

for

RCA Victor Superette, R-7 D. C.

and

RCA Victor Console, R-9 D.C.

The RCA Victor Superette, R-7 D.C. and the Console, R-9 D.C. are similar to the A.C. Models with the exception that the necessary changes for D.C. operation have been made. The Service Notes on the A.C. Models, therefore, apply to the D.C. Models with the exception of voltage readings and circuit diagrams.

Provision for operation at 220 volts is made by the use of a separate resistance unit which drops the voltage to 110. This unit should be located in a place that is well ventilated and it should not come in contact with any wood or cloth material other than that upon which it is resting.

An interlock is provided on the cabinet back so that access to the parts cannot be made without opening the power supply. However, when service work is being performed, it may be necessary to run jumpers from the back to the connection block so that operation of the receiver may be secured. *Never make these interlocks inoperative except under these conditions.* They are designed for protection of the customer.

The replacement parts are shown in the following list and the voltage readings on the reverse side. Figure 1 shows the schematic diagram and Figure 2 the wiring diagram.

REPLACEMENT PARTS

Part No.	DESCRIPTION	List Price
	PARTS COMMON TO R-7 D.C. AND R-9 D.C.	
2240	Resistor—30,000 Ohms—Carbon type	$0.70
2546	Resistor—1 Megohm—Carbon type—Package of 5	3.00
2731	Resistor—10,000 Ohms—Carbon type—Package of 5	2.00
2746	Socket—Dial lamp socket	.50
2749	Capacitor—2,400 Mmfd.—Used as 2nd Detector R.F. by-pass capacitor	1.50
2875	Knob—Station Selector, Tone Control or Volume Control Knob—Package of 5	1.50
2881	Bracket—Dial lamp bracket—Package of 5	.50
2882	Socket—Five prong Radiotron Socket complete with insulating shield—Five used	.50
2946	Escutcheon—Station Selector Escutcheon	.60
2968	Socket—Four prong Radiotron Socket complete with insulating shield—Two used	.50
2973	Board—Magnetic Pickup terminal board complete with terminals and screws—Package of 2	.50
2990	Resistor—4,500 ohms—Carbon type—Package of 5	2.50
2991	Transformer—1st I. F. Transformer complete with shield and mounting screws	3.00
2992	Transformer—2nd I. F. Transformer complete with shield and mounting screws	3.00
2993	Board—Resistor mounting board complete with terminals and mounting brackets—less resistors	1.00
2994	Coil—2nd Detector R.F. Choke Coil complete with rivet	.60
2995	Volume Control—complete less knob—Package of 5	6.00
2996	Tone Control—Complete less knob—Package of 5	6.00
2997	Coil—R.F. coil complete with mounting washer and nut	1.90
2998	Coil—1st Detector and Oscillator Coil assembly complete with mounting washers and nuts	2.40
2999	Shaft—Dial Scale drive shaft complete with mounting screws and lock washers	.50
3000	Scale—Dial drum and scale complete with set screws	.60
3001	Resistor—1.9 Ohms—Porcelain resistor used in parallel with dial lamp	.60
3002	Resistor—20 Ohms—Porcelain resistor used across UX-245 filaments	.60
3003	Cushion—Sponge Rubber Cushions—Package of 4	.50
3004	Resistor—Porcelain type—180 Ohms—used as heater supply resistor—Three used	1.80
3005	Screw Assembly—Loudspeaker Screws, Nuts, Eyelets and Washers—Package of 1 set of four, each (for R-7)	$ .50
3045	Resistor—40,000 ohms—Carbon type—Package of 5	2.50
3071	Plug—Male and Female power plug—used as interlock—Set of 2 Complete plugs	1.60
3072	Resistor Unit—Resistor Unit complete for use on 220 volt D.C. lines	19.00
3073	Switch—Operating switch	.80
7054	Cord—Power Cord and Plug	1.00
7062	Condenser—Adjustable Oscillator trimming condenser	1.00
7238	Capacitor Pack—R.F. by-pass capacitor pack in metal container	3.50
7239	Transformer—A.F. transformer assembly in metal container	6.00
7240	Reactor—Filter reactor	5.50
7241	Condenser—3-gang tuning condenser complete with mounting washers and screws	8.00
8559	Ring—Cone retaining ring	.80
8601	Cone—Cone complete—Package of 5	15.00
8639	Coil—Loudspeaker field coil complete with cone support	5.00
9323	Loudpseaker—Loudspeaker unit complete	8.70
9338	Receiver Assembly—Receiver Assembly complete—less loudspeaker and Radiotrons	40.00
	SPECIAL PARTS FOR R-9 D.C.	
3070	Bolts—Speaker mounting bolts, nuts and washers—Package of 2	.50
7222	Foot	.50
8664	Control panel	7.50
8665	Board—Baffle board complete with grille cloth	1.00
9329	Stretcher	4.50
9331	Top	3.25
9332	Post—Front post R. H.	2.50
9333	Post—Back post R. H.	2.50
9334	Post—Front post L. H.	2.50
9335	Post—Back post L. H.	2.50
9350	Cabinet—R-9 D.C. cabinet complete—Less all equipment	55.00
9357	Door—Rear cabinet door	5.00
	SPECIAL PARTS FOR R-7 D.C.	
7242	Cloth—Grille cloth complete with baffle board	1.00
9322	Panel—R-7 D.C. back panel—Less resistors and power cord	2.00
9325	Cabinet—R-7 cabinet—Walnut—Less back panel	15.00

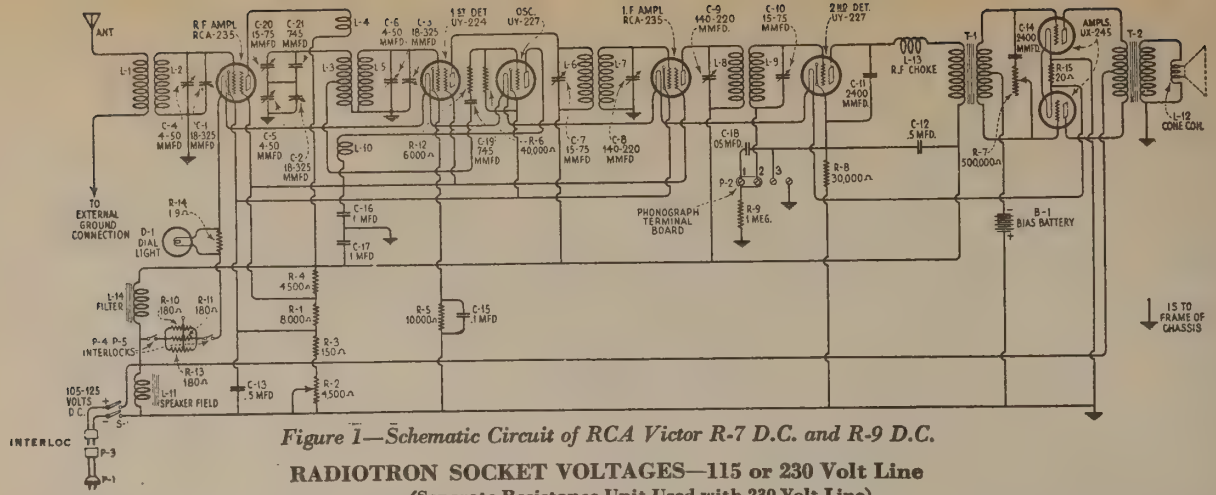


Figure 1—Schematic Circuit of RCA Victor R-7 D.C. and R-9 D.C.

RADIOTRON SOCKET VOLTAGES—115 or 230 Volt Line

(Separate Resistance Unit Used with 230 Volt Line)

Tube No.	Cathode to Heater Volts, D.C.	Cathode or Filament to Control Grid Volts, D.C.	Cathode to Screen Grid Volts, D.C.	Cathode or Filament to Plate Volts, D.C.	Plate Current M. A.	Screen Grid Current M. A.	Heater or Filament Volts, A.C.
VOLUME CONTROL AT MINIMUM							
1	40	30	40	75	0	0	2.3
2	20	0	—	40	2.0	—	2.3
3	6.0	3.5	65	100	.25		2.3
4	17.0	26	40	75	.0	0	2.3
5	2.0	*2.0	—	90	.23	—	2.3
6	—	25.0	—	100	4.0	—	2.3
7	—	*25.0	—	100	4.0	—	2.3
VOLUME CONTROL AT MAXIMUM							
1	10.0	2.0	50	100	3.5	**0.5	2.3
2	6.0	.0		50	3.0	—	2.3
3	8.0	5.0	50	100	0.5	.0	2.3
4	10.0	2.0	50	100	2.5	**1.0	2.3
5	2.0	*2.0	—	90	.25	0	2.3
6	—	*25.0	—	100	4.0	—	2.3
7	—	*25.0	—	100	4.0	—	2.3

* Not true reading due to Resistance in circuit

**This may be plus or minus depending on age of tubes

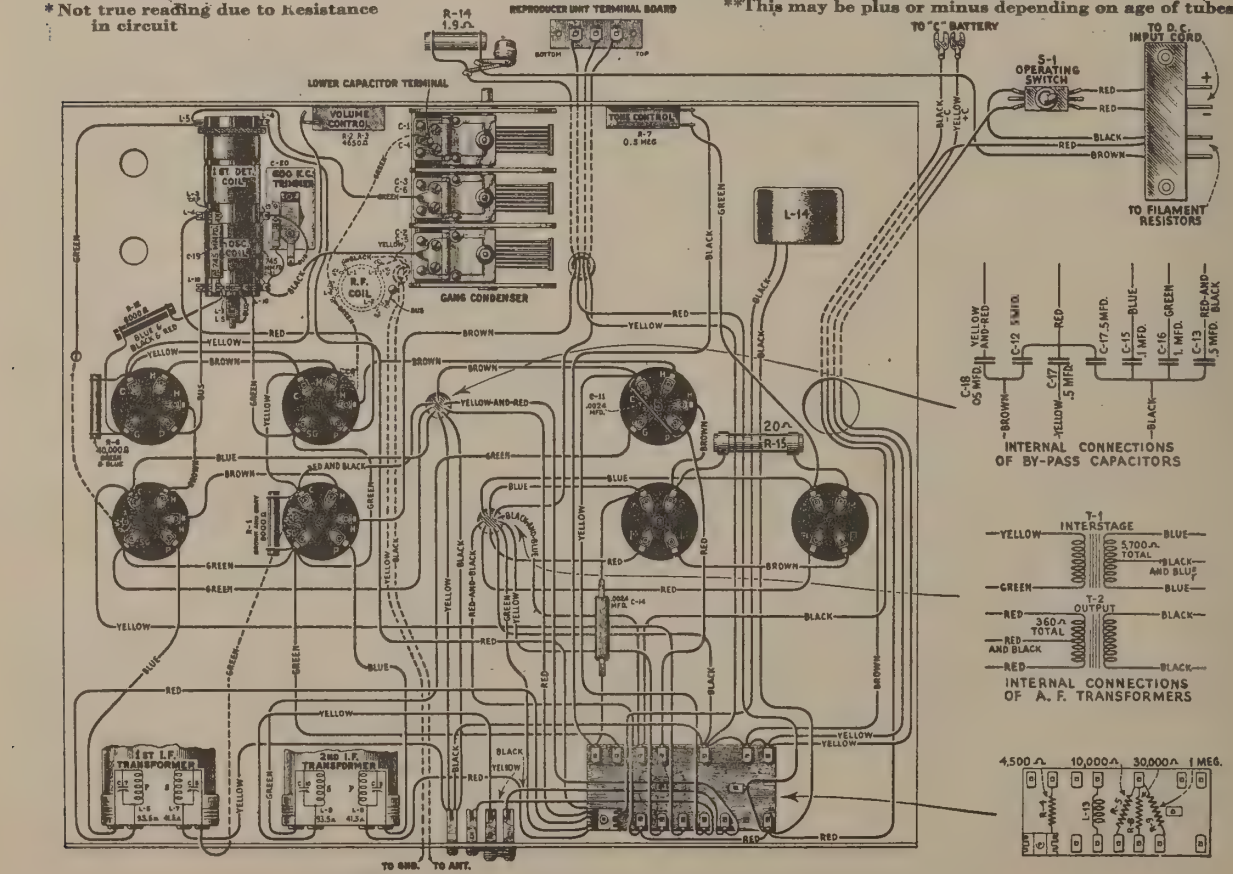


Figure 2—Wiring Diagram of RCA Victor R-7 D.C. or R-9 D.C.

International Division **RCA Victor Company, Inc.** Camden, N. J. U. S. A.

Form 3415 ra hjr

Instructions for

RCA Victor Shield Kit

Model SK-7

INTRODUCTION

The RCA Victor Shield Kit SK-7 makes possible more quiet reception with radio receivers situated in close proximity to a source of electrical noise interference. Such interference may be produced by electrical power plant machinery and associated distribution systems or, more commonly, by any of a variety of electrical devices or appliances of which street railways, oil burners and vacuum cleaners are known offenders. It is ordinarily "picked up" on the antenna lead-in wire or at the set itself and when amplified may destroy the quality of or entirely eradicate desirable radio programs.

With this system, both the lead-in wire and the radio chassis are fully shielded against such "pick up." The quality of incoming signals, therefore, can be affected only by natural atmospheric disturbances (commonly known as static) and by man-made interference picked up directly on the antenna. To insure greatest freedom from the latter effect, it is important that the antenna shall be installed as far as possible from any local electrical apparatus (in the above general category) and at a right angle to the nearest electric railway or power distribution line. The shield cover, which encloses the entire top part of the receiver unit, is arranged for ready adaptation to any of the following RCA Victor console radio receivers: models R-78, R-77, R-76, R-21 and R-11; also combination model RE-81.

INSTALLATION

A typical antenna installation equipped with the shield kit is shown in Figure 1. The kit, as furnished, consists of two transformers, a radio chassis shield cover, and a short flexible shielded conductor. One of the transformers (with three leads attached), together with a suitable lightning arrester, should be mounted on the antenna mast adjacent to the lead-in. The second transformer should be mounted in the receiver cabinet near the radio chassis. The connections between the two transformers should be made with weather-proof low-capacity shielded cable. Best results will be obtained using RCA Victor Cabloy "RF-5050" (see inset, Fig. 1). This cable has been developed especially for such applications and may be obtained in the length required from your dealer. Its heavy external lead sheath is suitable for fastening sup port and ground clamps where required. For best performance, the shield covering of this cable should be grounded at the antenna end in addition to the customary water pipe or radiator connection inside the dwelling. Excellent auxiliary grounding facilities will be found available in many installations through the adaptation of an existing large-area conducting medium such as a metallic roof or fire escape.

Electrical connections to the internal terminals of the transformer at the receiver are made upon removal of the main case section from its mounting plate and are clearly illustrated by the detailed internal view at the upper right in Figure 1. The end of the Cabloy lead sheath must be secured beneath the support clamp, and the internal copper strip must be soldered to the ground terminal, both of which will be found attached to the inner surface of the mounting plate. After making all connections reassemble the main case section of the transformer upon its mounting plate, making certain that the Cabloy and the short flexible shielded conductor are brought through the slots provided. Then fasten the transformer (by means of wood screws) to the inside of the cabinet in the most convenient location.

The existing antenna and ground leads (black and yellow, respectively) extending from the receiver unit must be removed from the terminals by which they are secured to the antenna coil (mounted vertically on radio chassis near front). Then solder the free end of the shielded conductor to these terminals—the internal insulated wire to the antenna terminal and the external metallic braid covering to the ground terminal.

> Important—The ground terminal of the antenna coil in all cases must be connected to the chassis. In models R-76, R-77, R-78 and RE-81, this connection has been made at the factory and upon examination should be found intact. In models R-11 and R-21, make this connection by soldering a wire from the ground terminal of the coil to the coil bracket as shown in Figure 1.

Mounting of the shield cover can be effected only by removal of the radio chassis from its metallic supporting brackets. The control knobs and the two wood screws at the rear of each supporting bracket must first be removed in order to disengage the radio chassis. Clamp the shield cover to the chassis by means of the small bolts which attach the lower metallic cover to the chassis base. The shield also must be electrically grounded to the chassis metal by a wire connection as shown in Figure 1 (inset at lower right).

> NOTE—All receivers listed in the introductory section, except model R-78, are of the single unit type and afford sufficient space at the bottom of the cabinet for resting the chassis while adding the shield cover. In

model R-78 the radio receiver chassis (upper unit) must be entirely removed from the cabinet. This is accomplished by disconnecting the radio chassis cable from the small terminal board located at the rear right corner of the amplifier (lower unit). The metallic protective cover enclosing the terminal board may be removed by loosening the single clamping screw.

Ventilation openings are provided in the top surface and in the rear apron of the shield cover. More rapid dissipation of heat, however, is necessary in models R-76, R-77 and RE-81 in which the new mercury-vapor rectifier (Radiotron RCA-82) will be enclosed by the shield cover. To provide for this, the cylindrical tube shield enclosing the rectifier must be removed.

In mounting the shield cover, make certain that the antenna shielded cable and the external grid lead or leads enter the assembly through the slots provided at the bottom of the rear apron. Replace the metal supporting brackets on the chassis side flanges and mount the assembly in its proper position in the cabinet. Then re-insert the wood screws used to secure the supporting brackets and attach the knobs to the control shafts.

NOTE—Subsequent replacement of Radiotrons may be made simply by removal of the rear portion of the cover which is attached to the main section by means of three screws at each side.

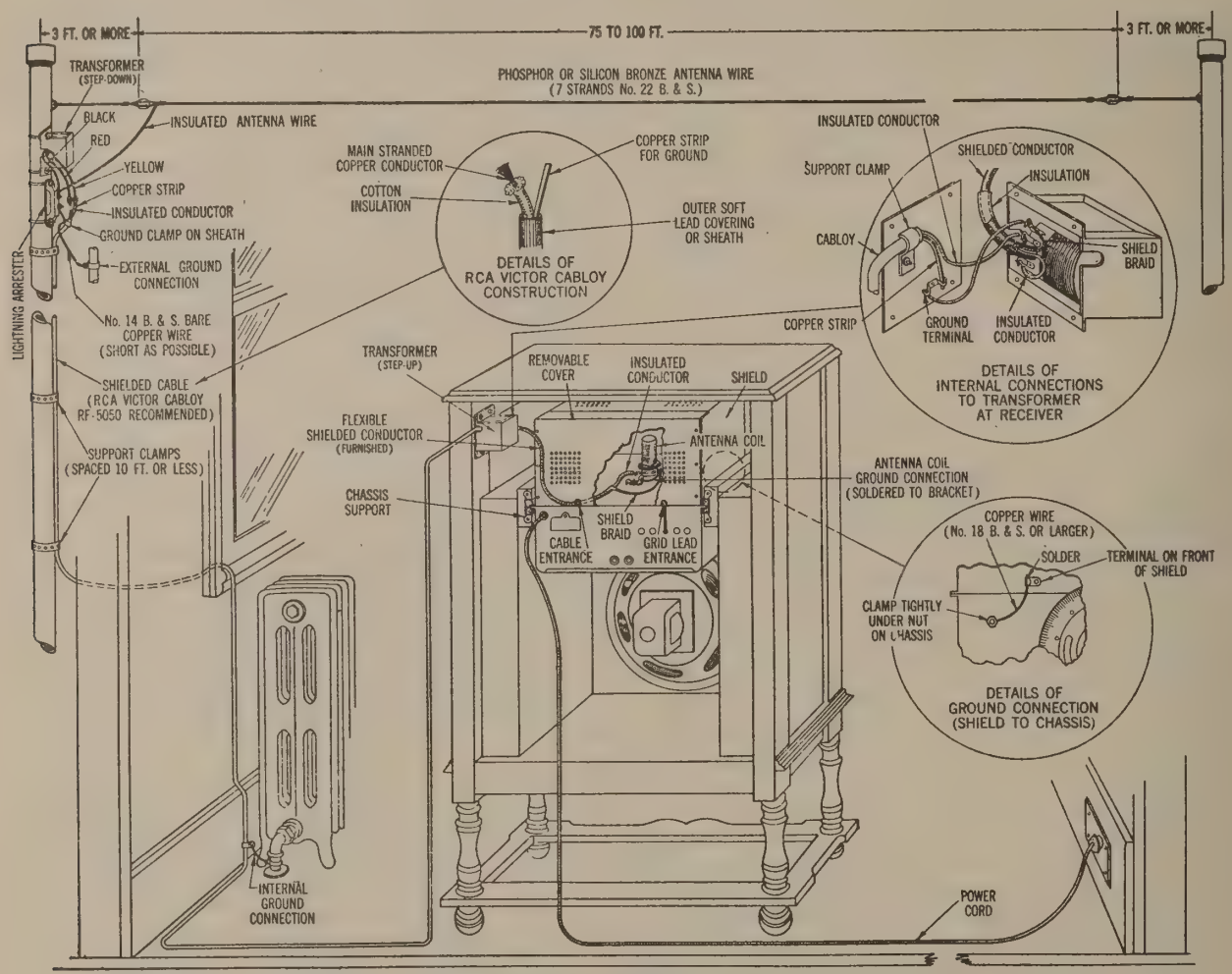


Figure 1—Typical Shield Kit Installation

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
	SHIELDED ANTENNA EQUIPMENT	
7575	Transformer—Antenna coupling transformer	$1.64
7576	Transformer—Receiver coupling transformer	2.40
8975	Shield—Receiver, chassis shield	4.80

.0525

RCA Victor Company, Inc.

Camden, New Jersey, U. S. A.

23122
S. O. 759684—2M

SERVICE NOTES
for
RCA Victor Models R-8 and R-12

ELECTRICAL SPECIFICATIONS

Voltage Rating ..... 105–125 Volts
Frequency Rating ..... 50–60 cycles and 25–40 cycles
Power Consumption ..... 100 Watts
Type of Circuit ..... Super-Heterodyne
Type and number of Radiotrons ..... 2 RCA-235, 3 UY-227, 1 UY-224, 1 RCA-247 and 1 UX-280
Number of R.F. Stages ..... One
Number of I.F. Stages ..... One
Type of Second Detector ..... Power self biasing
Type of Tone Control ..... Variable resistance
in series with condenser that tunes secondary of interstage transformer at "low" position
Type of Automatic Volume Control UY-227
controlling R.F. and I.F. stages by means of drop across resistor in plate circuit constituting bias on R.F. and I.F. stages
Number of Audio Stages ..... One—Single Pentode
Type of Rectifier ..... Full wave, UX-280
Undistorted output ..... 2.5 Watts

PHYSICAL SPECIFICATIONS—R-8

Height ..... 19 inches
Depth ..... 10¾ inches
Width ..... 14 inches
Weight alone ..... 38 lbs.
Weight Packed for Shipment ..... 44 lbs.

PHYSICAL SPECIFICATIONS—R-12

Height ..... 40 inches
Depth ..... 11½ inches
Width ..... 23½ inches
Weight alone ..... 61 lbs.
Weight Packed for Shipment ..... 84 lbs.

RCA Victor Models R-8 and R-12 are eight tube Super-heterodyne radio receivers incorporating such features as Super-Control, Screen Grid Radiotrons, Automatic Volume Control, Pentode output tube and the inherent sensitivity, selectivity and tone quality of the RCA Victor Super-Heterodyne.

Model R-8 is a table type receiver and the R-12 is of the Console type. Except for the Dial Scale, both models use the same chassis, which is also identical with that of the R-10.

A reference to the Service Notes already published on the R-11 and R-7 will give details of any service information required on these receivers. Figure 1 shows the schematic diagram and Figure 2 the wiring. The voltage readings are listed below and the replacement parts on the following pages.

RADIOTRON SOCKET VOLTAGES

120 VOLT LINE
VOLUME CONTROL DOES NOT AFFECT VOLTAGES

Radiotron No.	Cathode to Heater Volts, D. C.	Cathode or Filament to Control Grid Volts, D. C.	Cathode or Filament to Screen Grid Volts, D. C.	Cathode or Filament to Plate Volts, D. C.	Plate Current M. A.	Screen Current M. A.	Heater or Filament Volts, A. C.
1. R. F.	4.0	0.5	70	260	4.0	0.5	2.66
2. Osc.	4.0	0	—	65	6.0	—	2.66
3. 1st Det.	7.0	6.0	70	260	0.75	0.1	2.66
4. I. F.	4.0	4.0	70	260	4.0	0.5	2.66
5. 2nd Det.	28.0	10.0	—	250	1.0	—	2.66
6. A. V. C.	0	0	—	25	0	—	2.66
7. Power	—	10.0	290	280	35.0	—	2.66

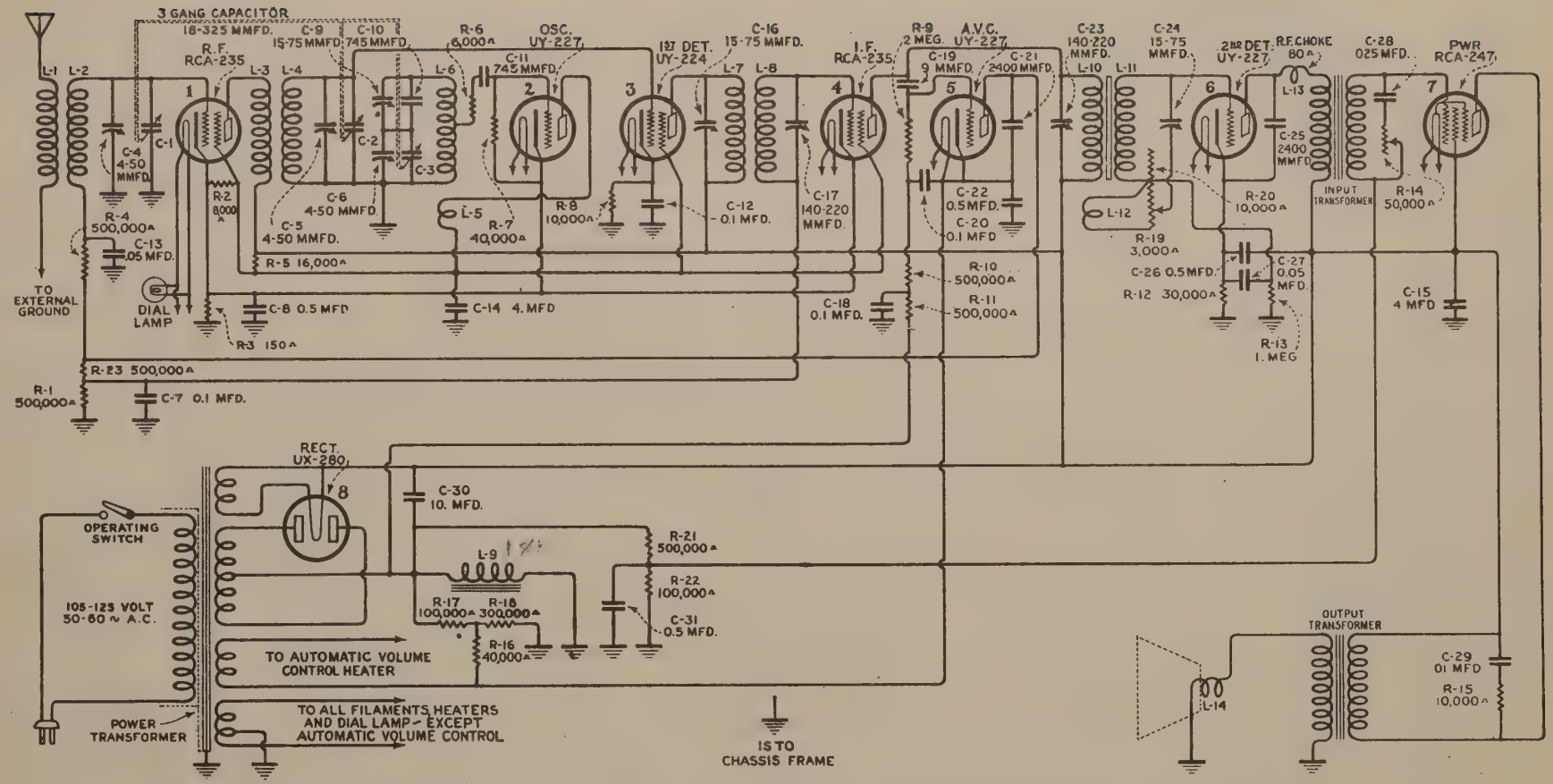


Figure 1—Schematic Diagram

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
	RECEIVER PARTS COMMON TO R-8 AND R-12	
2563	Resistor—6,000 ohms—Carbon type—1 watt—Package of 5	$3.00
2734	Capacitor—745 mmfd.—Package of 5	2.20
2746	Socket—Dial lamp socket	.50
2747	Cap—Grid contactor cap—Package of 5	.50
2749	Capacitor—2400 mmfd.	1.50
2882	Socket—UY Radiotron socket complete with insulation strip—7 used	.50
2963	Resistor—8,000 ohms—Carbon type—1 watt—Package of 5	2.50
2968	Socket—UX Radiotron socket complete with insulation strip—1 used	.50
2970	Resistor—500,000 ohms—Carbon type—1 watt—Package of 5	2.50
3003	Cushion—Sponge rubber cushion—Package of 4	.50
3024	Capacitor—9 mmfd.—Package of 2	.50
3045	Resistor—40,000 ohms—Carbon type—1 watt—Package of 5	2.50
3048	Resistor—500,000 ohms—Carbon type—½ watt—Package of 5	2.50
3049	Resistor—150 ohms—Carbon type—½ watt—Package of 5	2.50
3056	Shield—Radiotron shield—4 used—Package of 2	.50
3076	Resistor—1 megohm—Carbon type—½ watt—Package of 5	2.50
3077	Resistor—30,000 ohms—Carbon type—½ watt—Package of 5	2.50
3078	Resistor—10,000 ohms—Carbon type—½ watt—Package of 5	2.50
3079	Resistor—40,000 ohms—Carbon type—½ watt—Package of 5	2.50
3081	Resistor—16,000 ohms—Carbon type—3 watt	.60
3092	Volume control—Volume control complete with mounting nut	1.50
3095	Coil—R. F. coil—Complete with mounting bracket	1.90
3137	Knob—Tuning control, volume control and tone control knob—Package of 5	3.25
3234	Tone control—Tone control complete with mounting nut	1.90
3235	Coil—First detector and oscillator coil	2.85
3251	Coil—R. F. choke coil	.90
6185	Resistor—100,000 ohms—Carbon type—½ watt—Package of 5	2.00
6186	Resistor—500,000 ohms—Carbon type—¼ watt—Package of 5	2.00
6187	Resistor—300,000 ohms—Carbon type—½ watt—Package of 5	2.00
6188	Resistor—2 megohm—Carbon type—½ watt—Package of 5	2.00
7054	Cord—Power cord	1.00
7062	Capacitor—Adjustable capacitor—15–70 mmfd.	1.00
7298	Capacitor—0.01 mfd.	.80
7340	Transformer—First intermediate transformer	3.00
7341	Transformer—Second intermediate transformer	3.00
7342	Capacitor—Comprising two 0.05 mfd., four 0.5 mfd., one 10.0 mfd., two 4.0 mfd. and four 0.1 mfd. capacitor in metal container	7.85
7343	Transformer—Audio transformer	$3.85
7344	Transformer—Power transformer	8.00
7348	Board—Resistor board complete less resistors and capacitors	2.30
7362	Capacitor—0.025 mfd.	1.00
8770	Transformer—Power transformer—105–125 volts, 25–40 cycles	12.00
8771	Transformer—Power transformer—220 volts, 60 cycles	9.00
8837	Support—Receiver chassis metal mounting bracket—Package of 4	.70
	RECEIVER PARTS SPECIAL TO R-8	
2999	Shaft—Tuning condenser drive shaft complete	.50
3029	Bracket—Dial lamp bracket and indicator	.50
3097	Scale—Dial drum and scale with set screws—Package of 2	.50
7241	Capacitor—3 gang tuning capacitor	8.00
	RECEIVER PARTS SPECIAL TO R-12	
6189	Bracket—Dial lamp bracket and indicator—Pkg. of 2	.65
6190	Shaft—Tuning condenser drive shaft complete with 3 washers—Package of 5	.85
6191	Cord—Tuning condenser drive cord—Package of 5	.55
6192	Spring—Tuning condenser drive cord tension spring—Package of 10	.50
7438	Capacitor—Variable tuning capacitor	5.20
7439	Drum—Dial drum with set screw	.50
7440	Scale—Dial and dial scale	.75
	LOUDSPEAKER	
6174	Screw assembly—Speaker mounting screw assembly—Comprising 4 screws, 8 nuts, 4 washers and 4 eyelets—Package of 1 set—For R-8	.50
3237	Screw assembly—Speaker mounting screw assembly—comprising 4 screws, 8 nuts, 4 washers and 4 eyelets—Package of 1 set—For R-12	.50
6184	Board—Terminal board complete with 3 terminals and mounting rivets—Package of 5	.50
7345	Coil—Speaker field coil assembly—Comprising coil, cone housing and magnet	5.00
8559	Ring—Cone retaining ring	.80
8601	Cone—Speaker paper cone—Package of 5	15.00
	R-8 CABINET PARTS	
X-32	Baffle board and grille cloth	.90
6113	Foot—Cabinet felt foot—Package of 15	.50
7435	Escutcheon—Tuning dial escutcheon complete with mounting screws	.90
9402	Cabinet—Cabinet complete less equipment	16.00
	R-12 CABINET PARTS	
X-44	Top	4.65
X-45	Leg	2.00
X-46	Foot	1.10
X-47	Stretcher	4.50
X-48	Baffle board and grille cloth	.95
X-49	Mouldings—Control panel mouldings—Comprising 1 bottom moulding, 4 vertical mouldings, 1 top moulding and 2 center ornaments—Package of 1 set	3.95
7441	Escutcheon—Tuning dial escutcheon complete with mounting screws	1.05
9405	Cabinet—Cabinet complete less equipment	47.50

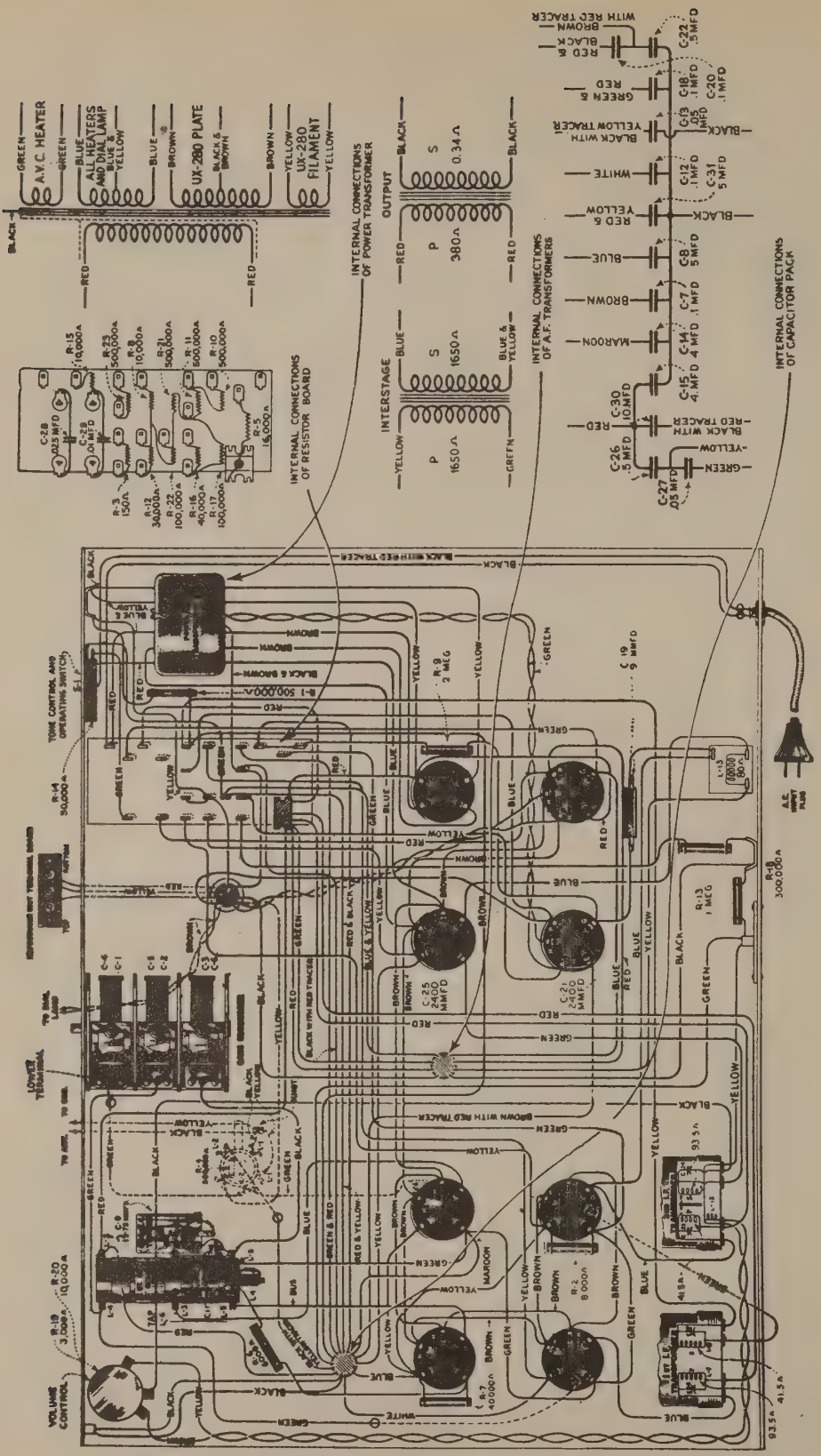


Figure 2—Wiring Diagram

SERVICE DIVISION

RCA Victor Company, Inc.

Camden, N. J., U. S. A.

S. O. 8733 20M—1 14-'32

Service Notes for

RCA Victor R-8 D. C. (220 volt)

ELECTRICAL SPECIFICATIONS

Voltage Rating	200–230 Volts
Power Consumption	75 Watts
Type of Circuit	Super-Heterodyne
Type and Number of Radiotrons	2 RCA-237, 2 RCA-239, 1 RCA-236, 2 UX-171-A, Total 7
Number of R. F. Stages	One
Number of I. F. Stages	One
Type of Second Detector	Power Self Biasing
Type of Tone Control	Variable Resistance in series with condenser across secondary of input transformer. Reduces high and increases low frequency output at "low" position.
Number of Audio Stages	One—Push-Pull UX-171-A
Undistorted Output	1.5 Watts

PHYSICAL SPECIFICATIONS

Height	19 inches	Width	14 inches
Depth	10¾ inches	Weight Alone	38 pounds
Weight Packed for Shipment		44 pounds	

RCA Victor R-8 D.C. (220 volt) is a table model Super-Heterodyne radio receiver similar in performance to the standard R-8 A. C. but using a chassis designed for 220 volt direct current only. Features such as low power consumption, use of automobile type Radiotrons, protected resistors and all the features of the A.C. model are included in this instrument.

Service information in regard to R.F. and I.F. line-up adjustments, will be found in the R-7 Superette Service Notes. The replacement parts are listed below and the voltage readings and circuit diagrams on the reverse side.

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
	RECEIVER ASSEMBLIES	
2240	Resistor—30,000 ohms—Carbon type—1 watt	$0.70
2546	Resistor—1 megohm—Carbon type—1 watt—Package of 5	3.00
2563	Resistor—6000 ohms—Carbon type—1 watt—Package of 5	3.00
2731	Resistor—10,000 ohms—Carbon type—1 watt—Package of 5	2.00
2734	Capacitor—745 mmfd.—Oscillator grid capacitor—Package of 5	2.20
2746	Socket—Dial lamp socket	.50
2747	Contact Cap—Package of 5	.50
2749	Capacitor—2400 mmfd.—Used as 2nd detector R.F. by-pass capacitor	1.50
2875	Knob—Station selector, tone control or volume control knob—Package of 5	1.50
2881	Bracket—Dial lamp bracket—Pkg. of 5	.50
2882	Socket—5 prong Radiotron socket with insulating shield—5 used	.50
2963	Resistor—8000 ohms—Carbon type—1 watt—Package of 5	2.50
2968	Socket—4 prong Radiotron socket with insulating shield—2 used	.50
2973	Board — Magnetic pickup terminal board complete with terminals and screws—Package of 2	.50
2991	Transformer—1st I.F. transformer complete with shield and mounting screws	3.00
2992	Transformer—2d I.F. transformer complete with shield and mounting screws	3.00
2993	Board—Resistor mounting board complete with terminals and mounting brackets—Less resistors	1.00
2995	Volume control—Complete less knob—Package of 5	6.00
2996	Tone control—Complete less knob—Package of 5	6.00
2999	Shaft—Dial scale drive shaft complete with mounting screws, washers and nuts	.50
3003	Cushions—Sponge rubber cushions—Package of 4	.50
3045	Resistor—40,000 ohms—Carbon type—1 watt—Package of 5	2.50
3050	Resistor—14,000 ohms—Carbon type—3 watt	.60
6295	Resistor—Dial lamp resistor—34 ohms—20 watt	$0.90
6296	Resistor—Filament and field supply resistor—2 used	1.10
6299	Switch—Operating switch	1.50
7054	Cord—Power cord and plug	1.00
7062	Condenser—Adjustable oscillator trimming condenser	1.00
7238	Capacitor pack—Comprising one 0.05, four 0.5, one 0.1 mfd. and one 1.0 mfd. capacitors in metal container	3.50
7239	Transformer—A.F. transformer assembly in metal container	6.00
7240	Reactor—Filter reactor	5.50
7241	Condenser—3 gang tuning condenser with mounting screws and washers	8.00
7493	Coil—R.F. coil complete with mounting washer and nut	1.90
7494	Coil—1st detector and oscillator coil assembly complete with mounting, washers and screws	2.85
7495	Scale—Dial scale with drum and set screws	.60
7496	Shield—Metal shield for Radiotrons—3 used	.50
	CABINET ASSEMBLIES (Prices Furnished Upon Request)	
X-32	Baffle board and grille cloth	
6113	Foot—Cabinet felt foot—Package of 15	
7497	Escutcheon — Tuning dial escutcheon with mounting screws	
9415	Cabinet—Complete less equipment	
	REPRODUCER ASSEMBLIES	
6174	Screw assembly—Reproducer mounting screw assembly—Comprising 4 screws 8 nuts, 4 washers and 4 eyelets—Package of one set	.50
6184	Board—Terminal complete with three terminals and mounting rivets	.50
7308	Coil assembly—Reproducer field coil assembly—Comprising field coil, cone bracket and magnet	6.00
8559	Ring—Cone retaining ring	.80
8601	Cone—Reproducer cone with voice coil—Package of 5	15.00

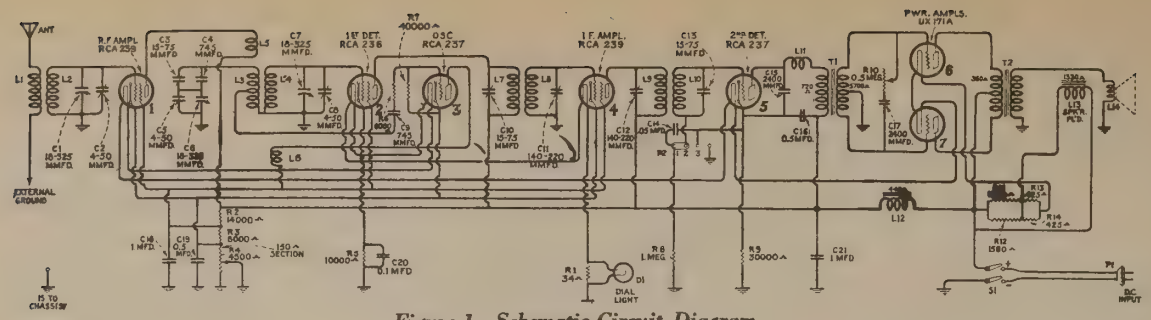


Figure 1—Schematic Circuit Diagram

230 Volt D. C. Line

Radiotron No.	Cathode to Heater, Volts, D. C.	Cathode or Filament to Control Grid, Volts, D. C.	Cathode or Filament to Screen Grid, Volts, D. C.	Cathode or Filament to Plate, Volts, D. C.	Plate Current, M. A.	Heater or Filament, Volts, D. C.
VOLUME CONTROL AT MINIMUM						
1—R. F.	+16	35	55	180	0	6.4
2—1st Det.	−12	4.5	80	210	0.5	6.4
3—Osc.	+18	—	—	60	2.0	6.4
4—I. F.	+26	35	55	175	0	6.4
5—2nd Det.	−10	5.0	—	180	0.5	6.4
6—Pwr.	—	46	—	175	17	5.0
7—Pwr.	—	36	—	180	30.0	5.5
VOLUME CONTROL AT MAXIMUM						
1—R. F.	−22	2.5	60	210	2.5	6.4
2—1st Det.	−14	3.0	60	205	0.5	6.4
3—Osc.	−20	—	—	65	2.5	6.4
4—I. F.	−10	2.5	60	210	3.0	6.4
5—2nd Det.	−10	5.0	—	175	0.5	6.4
6—Pwr.	—	46	—	170	17	5.0
7—Pwr.	—	35	—	180	30.0	5.5

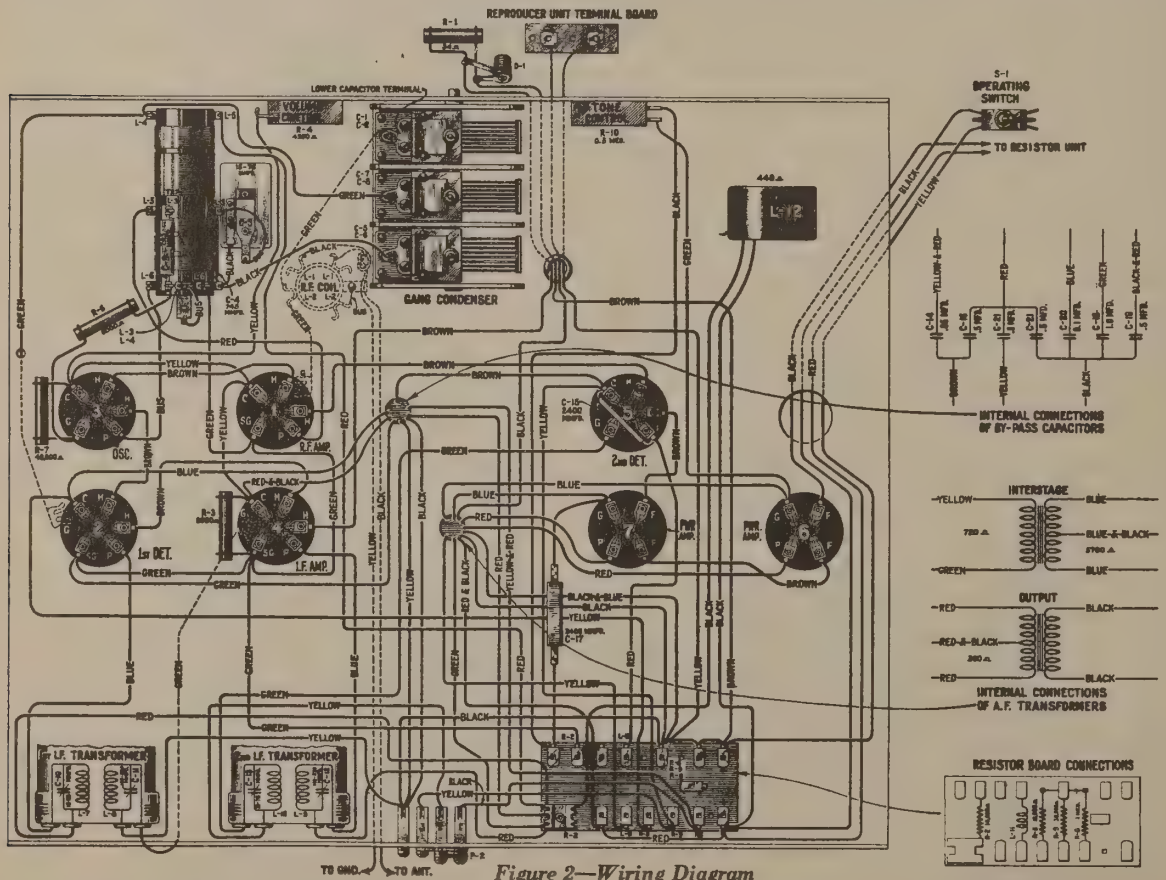


Figure 2—Wiring Diagram

Service Division **RCA Victor Company, Inc.** **Camden, New Jersey, U.S.A.**

S. O. 9251—1M—5-26-'32

SERVICE NOTES

for

RCA Victor Console, R-10

RCA Victor Console R-10 is an eight tube, automatic volume control, Pentode output Super-Heterodyne radio receiver. Features of this instrument are, screen grid super-heterodyne, quiet automatic volume control, single Pentode output tube, and the inherent sensitivity, selectivity and tone quality of the Super-Heterodyne circuit. The entire mechanism is housed in a cabinet of excellent construction and pleasing design.

SERVICE DATA

A reference to the Service Notes on the R-11 will give the details of making R. F. oscillator and I. F. adjustments. Other Service information on this type of receiver is contained in the Service Notes on the RCA Victor Superette R-7. Figure 1 shows the schematic wiring diagram and Figure 2 the wiring diagram. The replacement parts are shown below and the voltage readings on the reverse side.

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
	RECEIVER	
2563	Resistor—6,000 Ohms—Carbon type—Package of 5	$3.00
2730	Resistor—18,000 Ohms—Carbon type—Package of 5	2.00
2734	Capacitor—745 Mmfd.—Package of 5	2.20
2746	Socket—Tuning dial lamp socket	.50
2747	Caps—Grid connector caps—Package of 5	.50
2749	Capacitor—2400 Mmfd.	1.50
2875	Knobs—Volume control, tone control and tuning dial control knob—Package of 5	1.50
2882	Socket—Radiotron socket with insulator—7 used	.50
2968	Socket—Radiotron socket with insulator—1 used	.50
2999	Shaft—Tuning dial drive shaft	.50
3003	Cushions—Receiver chassis rubber cushions—Package of 4	.50
3024	Capacitor—9 Mmfd.—Package of 2	.50
3029	Bracket—Dial lamp bracket and indicator	.50
3045	Resistor—40,000 Ohms—1 Watt—Carbon type—Package of 5	2.50
3048	Resistor—500,000 Ohms—Carbon type—Package of 5	2.50
3049	Resistor—150 Ohms—Carbon type—Package of 5	2.50
3051	Resistor—5 Megohms—Carbon type—Package of 5	2.00
3056	Shield—Radiotron tube shield—Package of 2	.50
3076	Resistor—1 Megohm—Carbon type—Package of 5	2.50
3077	Resistor—30,000 Ohms—Carbon type—Package of 5	2.50
3078	Resistor—10,000 Ohms—Carbon type—Package of 5	2.50
3079	Resistor—40,000 Ohms—½ Watt—Carbon type—Package of 5	2.50
3081	Resistor—16,000 Ohms—Carbon type	.60
3092	Control—Volume control complete with mounting nut	1.50
3095	Coil—R. F. Coil—Complete with mounting bracket	1.90
3097	Scale—Dial scale and drum with set screw—Package of 2	.50
3234	Tone Control—Tone control and operating switch complete with mounting nut	1.90
3235	Coil—Detector and oscillator coil	2.85
3236	Escutcheon—Tuning dial escutcheon with mounting screws	.75
3241	Resistor—300,000 Ohms—Carbon type—Package of 5	2.50
3251	Coil—Choke coil	.90
3252	Resistor—100,000 Ohms—Carbon type—Package of 5	$2.75
7054	Cord—Power cord	1.00
7062	Capacitor—Adjustable oscillator trimmer capacitor	1.00
7241	Capacitor—3 gang tuning capacitor	8.00
7298	Capacitor—0.01 Mfd.	.80
7340	Transformer—1st intermediate transformer	3.00
7341	Transformer—2d intermediate transformer	3.00
7342	Capacitor—Comprising two 0.05 Mfd., four 0.5 Mfd., one 10.0 Mfd., two 4.0 Mfd. and four 0.1 Mfd. capacitors in metal container	7.85
7343	Transformer—Audio transformer	3.85
7344	Transformer—Power transformer—110 volts—60 cycles	8.00
7348	Board—Resistor board less resistors and capacitors	2.30
7362	Capacitor—0.025 Mfd.	1.00
8770	Transformer—Power transformer—110 volts—25 cycles	12.00
8771	Transformer—Power transformer—220 volts—60 cycles	9.00
	REPRODUCER	
3237	Screw assembly—Speaker mounting screw assembly—Comprising four screws, four washers, four eyelets, four nuts—Package of 1 set	.50
7345	Coil assembly—Comprising field coil, cone bracket and magnet	5.00
8559	Ring—Cone retaining ring	.80
8601	Cone—Reproducer paper cone—Package of 5	15.00
	CABINET	
7346	Foot	.90
7347	Moulding—Front top rail end moulding R. H. or L. H.—Package of 2	1.80
8772	Leg	3.75
8773	Moulding—Front top moulding	1.95
8774	Board—Baffle board and grille cloth	1.05
8775	Stretcher	4.40
9392	Cabinet—Cabinet complete less equipment	44.65
9393	Top	7.00
9394	Panel—Control panel	5.65

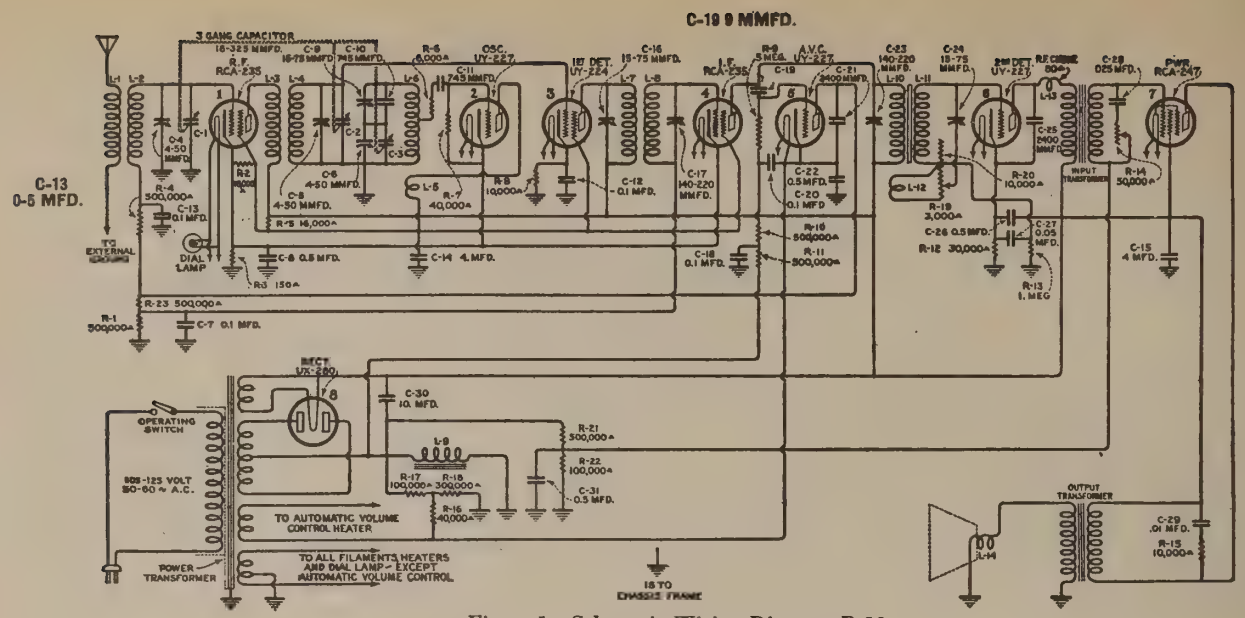


Figure 1—Schematic Wiring Diagram R-10

RADIOTRON SOCKET VOLTAGES

110 VOLT A. C. LINE

(Volume Control Setting Does Not Affect Voltages)

Radiotron No.	Cathode to Heater Volts, D. C.	Cathode or Filament to Control Grid Volts, D. C.	Cathode or Filament to Screen Grid Volts, D. C.	Cathode or Filament to Plate Volts, D. C.	Plate Current M. A.	Screen Current M. A.	Heater or Filament Volts, A. C.
1	2	*0.1	75	210	5.0	0.5	2.2
2	8	0	—	60	5.0	—	2.2
3	7	7.0	70	205	0.5	0.1	2.2
4	2	*0.1	75	210	5.0	0.5	2.2
5	0	0	—	30	0	—	2.2
6	20	*8.0	—	185	0.5	—	2.2
7	—	10	210	210	25	—	2.2

*Not true reading due to resistance in circuit.

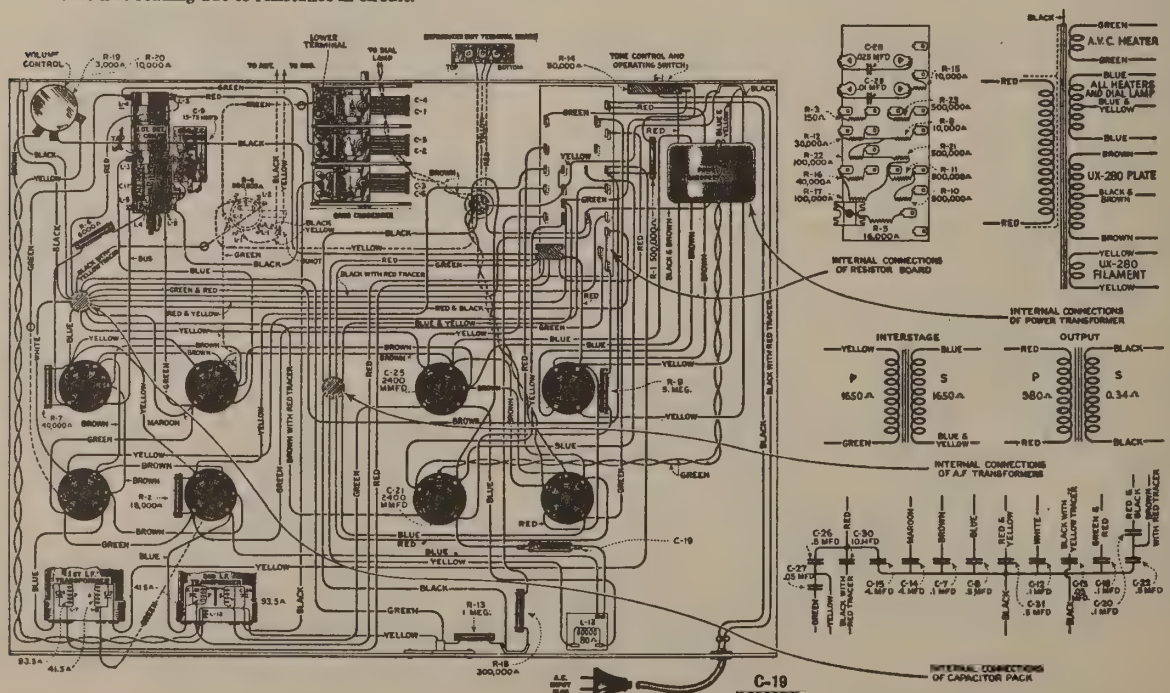


Figure 2—Wiring Diagram R-10

Service Division **RCA Victor Company Inc.,** Camden N. J., U. S. A.

SERVICE NOTES
for
RCA Victor R-10 D. C.

RCA Victor R-10 D.C. is a seven tube screen grid Super-Heterodyne Radio Receiver combined with an eight inch dynamic type loudspeaker and housed in a Console Cabinet of pleasing design.

Except for the omission of the interlock, the chassis used in this model is identical with that used in the R-7 and R-9 D.C. A reference to the Service Notes on these models should be made when service information pertaining to circuit diagrams or voltage readings are required. The replacement parts are listed below.

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
	RECEIVER ASSEMBLY	
2240	Resistor—30,000 ohms—Carbon type—1 Watt	$0.70
2546	Resistor—1 megohm—Carbon type—1 watt—Package of 5	3.00
2731	Resistor—10,000 ohms—Carbon type—1 watt—Package of 5	2.00
2746	Socket—Dial lamp socket	.50
2749	Capacitor—2400 mmfd.—Second detector radio frequency by-pass capacitor	1.50
2875	Knob—Station selector, tone or volume control knob—Package of 5	1.50
2881	Bracket—Dial lamp bracket—Package of 5	.50
2882	Socket—UY Radiotron socket—Complete with insulation shield—Five used	.50
2946	Escutcheon—Station selector escutcheon	.60
2968	Socket—UX Radiotron socket—Complete with insulation shield—Two used	.50
2973	Board — Magnetic pickup terminal board—Complete with terminals and screws—Package of 2	.50
2990	Resistor—4500 ohms—Carbon type—1 watt—Package of 5	2.50
2991	Transformer—First I. F. transformer—Complete with shield and mounting screws	3.00
2992	Transformer—Second I. F. transformer—Complete with shield and mounting screws	3.00
2993	Board—Resistor board complete, less resistors	1.00
2994	Coil—Second detector R. F. choke coil—Complete with mounting rivet	.60
2995	Volume control—Complete, less knob—Package of 5	6.00
2996	Tone control—Complete, less knob—Package of 5	6.00
2997	Coil—R. F. coil—Complete with mounting washer and nut	1.90
2998	Coil—First detector and oscillator coil assembly—Complete with mounting washers and nuts	2.40
2999	Shaft—Dial scale drive shaft assembly complete	.50
3000	Scale—Dial drum and scale—Complete with set screws	.60
3001	Resistor—1.9 ohms—Porcelain—Used in parallel with dial lamp	.60
3002	Resistor—20 ohms—Porcelain type—Used across UX-245 filament	$0.60
3003	Cushion — Sponge rubber cushion — Package of 4	.50
3004	Resistor—180 ohms—Porcelain type—Used as heater supply—Three used	1.80
3045	Resistor—40,000 ohms—Carbon type—1 watt—Package of 5	2.50
3071	Plug—Male and female power plug—Used as interlock—Set of 2 complete plugs	1.60
3072	Resistor unit—Resistor unit complete for use on 220 volt D. C. lines	19.00
3073	Switch—Operating switch	.80
7054	Cord—Power cord and plug	1.00
7062	Capacitor—Adjustable capacitor—15–70 mmfd.	1.00
7238	Capacitor pack—Comprising one 0.05 mfd., four 0.5 mfd., one 0.1 mfd. and 1.0 mfd. capacitor in metal container	3.50
7239	Transformer—A. F. transformer assembly in metal container	6.00
7240	Reactor—Filter reactor	5.50
7241	Capacitor—Three gang tuning capacitor	8.00
	LOUDSPEAKER ASSEMBLY	
3237	Screw assembly — Speaker mounting screw assembly—Comprising 4 screws 8 washers, 8 nuts and 4 eyelets—Package of 1 set	.50
8559	Ring—Speaker cone retaining ring	.80
8601	Cone—Speaker paper cone—Package of 5	15.00
8639	Coil—Comprising field coil, magnet and cone support	5.00
	CABINET ASSEMBLY	
X31	Back frame assembly	7.85
6168	Hinge—Back frame hinge—Comprising 2 hinges and 12 mounting screws—Package of 1 set	.50
7346	Foot	.90
7347	Moulding—Front top rail end moulding—R. H. or L. H.—Package of 2	1.80
8772	Leg	3.75
8773	Moulding—Front top center moulding	1.95
8774	Board—Baffle board and grille cloth	1.05
8775	Stretcher	4.40
9393	Top	7.00
9394	Panel—Control panel	5.65
9401	Cabinet—Cabinet complete, less all equipment	52.25

Service Division

RCA Victor Company, Inc.

Camden, N. J., U. S. A.

S. O. 8813 5M—1-25-32

SERVICE NOTES
for
RCA Victor Radiola R-11

RCA Victor Console, R–11 is a nine tube Super-Heterodyne Radio Receiver providing excellent performance in all the features incorporated in modern radio broadcast receivers.

Automatic volume control, push-pull Pentode output stage, tone control, calibrated kilocycle dial, acoustically correct cabinets and the inherent sensitivity, selectivity and tone quality of the Super-Heterodyne are some of the features of this receiver. Referring to Figure 1, the schematic circuit diagram, and tracing a signal through the various stages, we find the following action taking place.

The first tube is the tuned R. F. stage. This is the new Super Control Screen Grid Radiotron, RCA-235. The outstanding feature of this Radiotron is that due to its grid potential plate current curve having a constant rate of curvature, cross modulation, modulation distortion, and hum modulation effects are eliminated from the receiver. Also it is very adaptable to automatic volume control action due to its characteristics that preclude the necessity of a local distant switch. The control grid bias for this Radiotron is varied by means of the automatic volume control tube.

The output of this circuit is coupled inductively to the grid coil of the first detector. At this point the oscillator should be considered as its output is also coupled inductively to the grid coil of the first detector. This is a tuned grid circuit oscillator using a Radiotron UY-227, and having a closely coupled plate coil that gives sufficient feed-back to provide stable operation. The grid circuit is so designed that by means of a correct combination of capacity and inductance a constant frequency difference between the oscillator and the tuned R. F. circuits throughout the tuning range of the receiver is obtained.

The next circuit to examine is the first detector. The circuit is tuned by means of one of the gang condensers to the frequency of the incoming signal. Radiotron UY-224 is used in this stage. In the grid circuit there is present the incoming signal and the oscillator signal, the latter being at a 175 K. C. difference from the former. The first detector is biased so as to operate as a plate rectification detector and its purpose is to extract the difference or beat frequency, produced by combining the signal and oscillator frequencies. The beat frequency—175 K. C. —appears in the plate circuit of the first detector which is accurately tuned to 175 K. C.

The next stage is that of the I. F. amplifier. A single stage is used, requiring two I. F. transformers, consisting of four tuned circuits. The plate circuit of the first detector, the grid and plate circuit of the I. F. amplifier and the grid circuit of the second detector are all tuned to 175 K. C. Radiotron RCA-235 is used in this stage and its control grid voltage is also varied by means of the automatic volume control tube.

At this point it is well to consider the action of the automatic volume control tube as it controls the R. F. and I. F. amplifiers of the receiver. The automatic volume control functions in the usual manner in that the signal voltage is applied to its grid and the voltage drop across a resistor in the plate circuit is the grid voltage applied to the I. F. and R. F. stages. As the value of the plate current is a direct result of the signal voltage applied to the grid, a greater plate current gives a greater voltage drop across the resistor in its plate circuit and therefore a higher bias on the I. F. and R. F. stage. This results in less sensitivity and vice versa. The signal output of the I. F. stage is always maintained at a constant value.

The volume control should now be considered as its position in the circuit has a large bearing on the quiet and smooth action of this receiver.

In previous automatic volume control receivers, the volume control was placed in the grid circuit of the automatic volume control tube, its action being to vary the control grid voltage of this tube. When operating sets of this character, the receiver jumped to full sensitivity when not tuned to a signal and if in a noisy location, this noise was very objectionable.

In this instrument, however, the volume control is not in the automatic volume control tube circuit, but in the grid circuit of the second detector. By means of it the signal voltage applied to the second detector is controlled and under no conditions can noise or other signals exceed the level for which it has been set. Electrically, the primary and secondary of the second I. F. transformer are shielded from each other so that there is no transference of energy except by means of a small pickup coil. The volume control is a potentiometer shunted across this coil which determines the amount of pickup that will be used. As a further means of controlling a strong signal, a second section is provided which places up to 10,000 ohms (R-21) in series with the tuned circuit of second detector grid. This effectively reduces even the most powerful signals received.

The second detector is a high-plate voltage, grid-biased type, using Radiotron UY-227, which gives sufficient output to drive two Radiotrons RCA-247 connected in push-pull without an intermediate audio stage. The purpose of the second detector is to extract the audio frequency component of the R. F. signal which represents the voice or musical modulations produced in the studio of the broadcasting station. The audio component is extracted and used to drive the power tubes while the R. F. current is by-passed and not further used.

A grid filter consisting of a 1 megohm resistor (R-13) in the second detector circuit and a 0.5 megohm resistor (R-4) in the R.F. circuit helps to reduce any possible hum in these stages. The power A. F. stage consists of two Radiotrons RCA-247 connected in push-pull. Transformer coupling is used between the detector and the grids of the Radiotrons RCA-247 as well as from the plates to the cone coil of the reproducer unit.

A tone control, consisting of a 0.008 mfd. condenser in series with a 200,000 ohm variable resistor connected across the two grids of Radiotrons RCA-247 is incorporated in this stage. The tone control functions to reduce the high frequency output as the resistance is reduced. At the extreme low position, the condenser and secondary of the A. F. transformer resonate at a low frequency and thereby further accentuate the bass response. The two 0.0004 mfd. condensers, connected in series with their mid-point grounded are connected across the secondary of the input transformer. The purpose of these condensers is to prevent audio oscillations and provide a high frequency audio cut-off.

A 0.005 mfd. condenser connected in series with a 10,000 ohm resistor is placed across the primary of the output transformer. This functions to reduce the third harmonic distortion, an inherent characteristic of the Pentode output tube. The direct plate and grid voltages are supplied from high voltage alternating current which is rectified by means of Radiotron UX-280. The filter is of the tapped reactor type which gives an output of well filtered D. C. The bias voltage for the Radiotrons RCA-247 is obtained by using a portion of the drop across the reproducer field. One 190,000 ohm and one 40,000 ohm resistors act as the voltage dividing resistors.

SERVICE DATA

Information pertaining to general service data for this type receiver may be obtained from the Service Notes already issued on the RCA Victor Radiola Superette. Figure 1 shows the schematic diagram, Figure 2 the proper connections for attaching a magnetic pickup to the R–11 and Figure 3 the wiring diagram. The voltage readings and replacement parts are shown on page 3.

R. F. OSCILLATOR AND I. F. ADJUSTMENTS

A reference to the RCA Victor Radiola Superette Service Notes will give the details for making correct R. F., I. F. and Oscillator adjustments. However, due to the use of an automatic volume control tube, its action will defeat the use of an output meter. To overcome this, a "dummy" Radiotron UY-227 (one that has one heater prong removed but is otherwise O.K.) should be substituted for the tube in the automatic volume control socket. *Do not make any adjustments with this tube removed from the socket.* While apparently everything functions in the normal manner, the lack of tube capacity in the circuits will cause an incorrect alignment to be made.

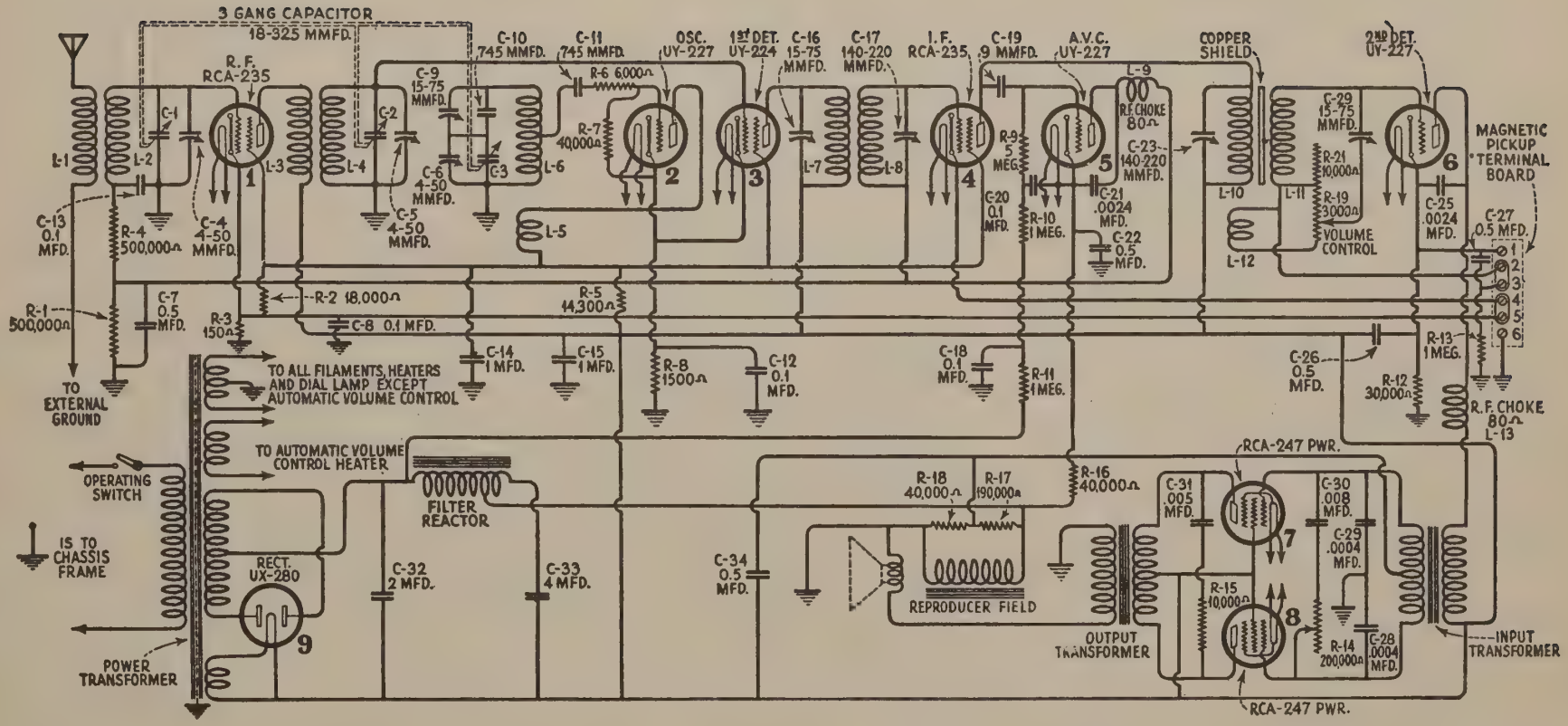


Figure 1—Schematic Circuit Diagram of Model R-11

RADIOTRON SOCKET VOLTAGES

110 VOLT A. C. LINE

(Volume Control Setting Does Not Affect Voltages)

Radiotron No.	Cathode to Heater Volts D. C.	Cathode or Filament to Control Grid Volts, D. C.	Cathode or Filament to Screen Grid Volts, D. C.	Cathode or Filament to Plate Volts, D. C.	Plate Current M. A.	Screen Current M. A.	Heater or Filament Volts, A. C.
1	2	*0.1	75	205	5.0	0.5	2.2
2	8	0	—	60	5.0	—	2.2
3	7	7.0	70	200	0.5	0.1	2.2
4	2	*0.1	75	205	5.0	0.5	2.2
5	0	0	—	25	0	—	2.2
6	20	*8.0	—	180	0.5	—	2.2
7	—	10	210	205	25	—	2.2
8	—	10	210	205	25	—	2.2

* Not true reading due to resistance in circuit.

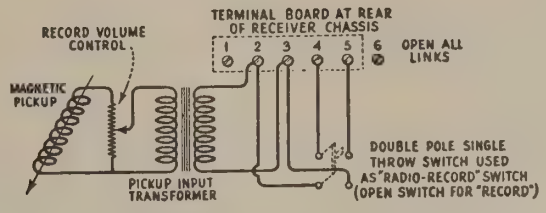

TERMINAL BOARD AT REAR OF RECEIVER CHASSIS
RECORD VOLUME CONTROL
1 2 3 4 5 6
OPEN ALL LINKS
MAGNETIC PICKUP
DOUBLE POLE SINGLE THROW SWITCH USED AS "RADIO-RECORD" SWITCH (OPEN SWITCH FOR "RECORD")
PICKUP INPUT TRANSFORMER

Figure 2—Magnetic Pickup Connections

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
2563	Resistor—6,000 ohms—Carbon type—Package of 5	$3.00
2730	Resistor—18,000 ohms—Carbon type—Package of 5	2.00
2734	Capacitor—745 mmfd.—Package of 5	2.20
2746	Socket—Dial lamp socket	.50
2747	Contact cap—Package of 5	.50
2749	Capacitor—2400 mmfd.	1.50
2875	Knobs—Package of 5	1.50
2882	Socket—UY Radiotron socket—Complete with insulating shield—8 used	.50
2968	Socket—UX Radiotron socket—Complete with insulating shield—1 used	.50
2999	Shaft—Dial drum drive shaft	.50
3029	Indicator—Tuning dial indicator—Complete with bracket	.50
3046	Resistor—190,000 ohms—Carbon type—Package of 5	2.50
3047	Resistor—1500 ohms—Carbon type—Package of 5	2.50
3048	Resistor—500,000 ohms—Carbon type—Package of 5	2.50
3049	Resistor—150 ohms—Carbon type—Package of 5	2.50
3050	Resistor—14,000 ohms—Carbon type—Package of 1	.60
3051	Resistor—5 megohm—Carbon type—Package of 5	2.00
3053	Capacitor—9 mmfd.—Package of 2	.50
3054	Escutcheon—Station selector escutcheon—With 4 mounting screws	.60
3055	Cushion—Chassis support cushion—Package of 4	.50
3056	Shield—Radiotron shield—6 used—Package of 2	.50
3076	Resistor—1 megohm—Carbon type—Package of 5	2.50
3077	Resistor—30,000 ohms—Carbon type—Package of 5	2.50
3078	Resistor—10,000 ohms—Carbon type—Package of 5	2.50
3079	Resistor—40,000 ohms—Carbon type—Package of 5	2.50
3085	Capacitor—400 mmfd.	.60
3089	Terminal board—Magnetic pickup terminal board	.50
3090	Board—A. V. C. and 2nd detector R. F. choke mounting board—Less choke coils	.50
3091	Board—Resistor board—Less resistor and capacitors	1.00
3092	Volume control—Complete with mounting nut	1.50
3093	Tone control—Complete with mounting nut	1.90
3094	Shield—Radiotron shield—1 used—Package of 2	.50
3095	Coil—R.F. coil—Complete with mounting bracket	1.90
3096	Coil—1st detector and oscillator coil—Complete with mounting bracket	3.55

Stock No.	DESCRIPTION	List Price
3097	Scale—Dial drum scale with set screws—Pkg. of 2	$0.50
3098	Capacitor—0.008 mfd.	.50
3099	Capacitor—0.005 mfd.	.75
7054	Cord—Power cord	1.00
7062	Capacitor—Adjustable oscillator trimmer capacitor	1.00
7241	Capacitor—3 gang tuning capacitor with mounting screws and washers	8.00
7266	Transformer—1st intermediate transformer	3.00
7267	Transformer—2d intermediate transformer	3.00
7268	Coil—Detector or A.V.C. R.F. choke coil—Complete with mounting rivet	.60
7269	Capacitor pack—In metal container—60 cycle	7.25
7270	Reactor—Filter reactor	4.00
7271	Transformer—Interstage transformer	4.25
7272	Transformer—Power transformer—105–125 volt, 50–60 cycles	12.00
7273	Capacitor pack—By-pass capacitor pack—25–40 cy.	10.00
7274	Transformer—Power transformer—105–125 volts, 25–40 cycles	15.00
7275	Transformer—Power transformer—220 volts, 50–60 cycles	10.00
	LOUDSPEAKER ASSEMBLY	
7257	Coil—Cone support with retaining ring, magnet and field coil	6.00
7258	Transformer—Output transformer	1.70
8559	Ring—Cone retaining ring	.80
8601	Cone—Cone with voice coil—Package of 5	15.00
	CABINET ASSEMBLY	
8691	Panel—Control panel	8.50
8692	Grille cloth and baffle board	.90
8693	Leg—Front—Right or left	1.25
8694	Leg—Back—Right hand	1.00
8695	Leg—Back—Left hand	1.00
8696	Stretcher	2.50
8697	Foot	.75
8698	Top	5.50
8699	Ornament—Control panel ornament	2.25
9358	Cabinet—Complete less all equipment	62.50

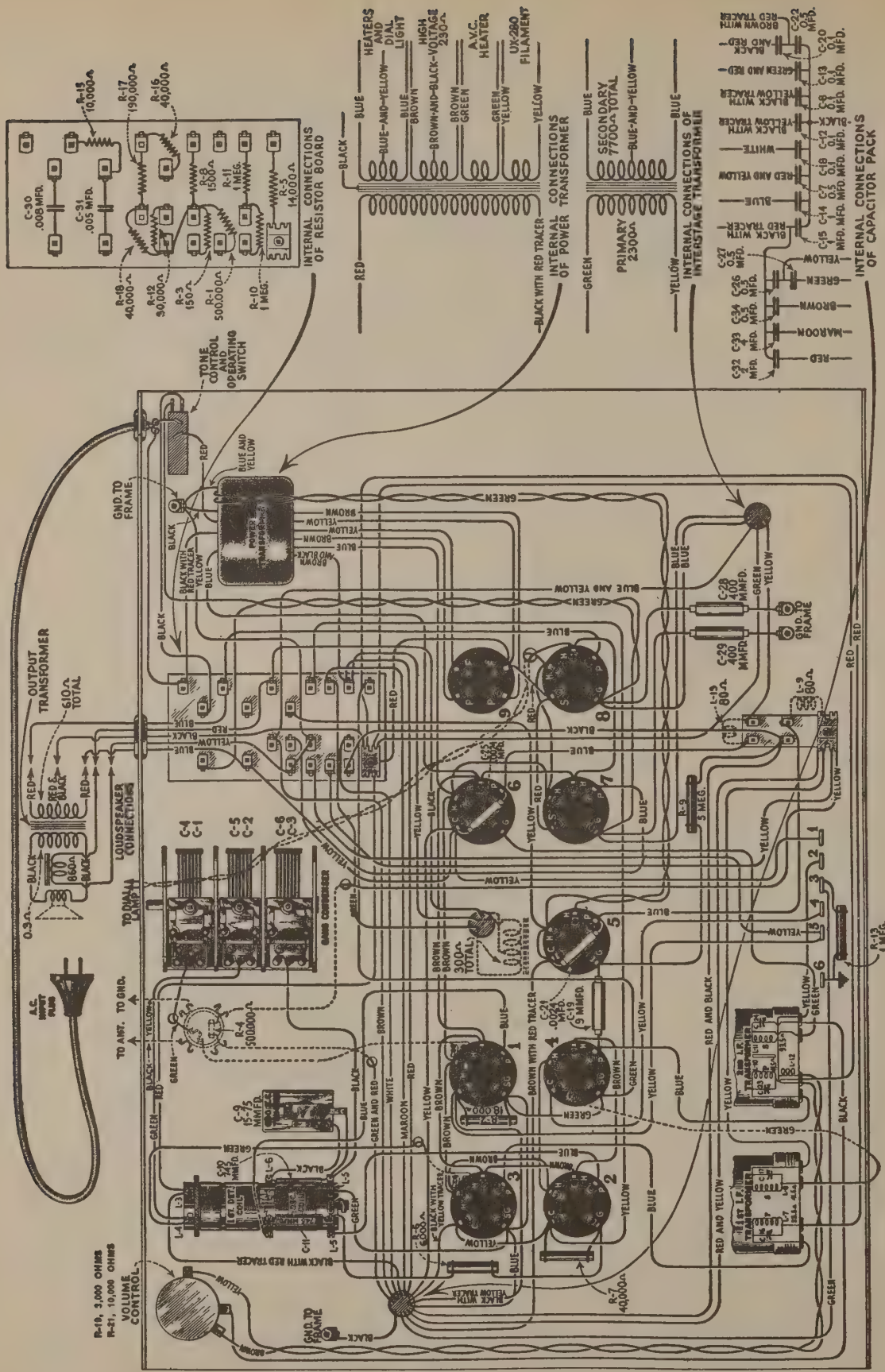


Figure 3—Wiring Diagram of Model R-11

Service Division RCA Victor Co., Inc. Camden, N. J.

S. O. 19878 750—1-27-'32

SUPPLEMENT

to

RCA Victor Radiola R-11 Service Notes

Late production of the RCA Victor Radiola R-11 has a slight change in the wiring, two changes in capacitor values and the addition of a 0.5 megohm resistor (R-20). Capacitor C-7 has been changed from 0.5 mfd. to 0.1 mfd. and C-13 from 0.1 mfd. to 0.05 mfd. Resistor R-20 has been added.

Figure 1 shows the revised schematic diagram and Figure 2 the wiring diagram.

The replacement parts listed and supplied are entirely interchangeable with either the old or new models. In the case of the older models, however, the additional black lead supplied in the new capacitor pack should be joined to the old black ground lead. All other capacitor leads are exactly the same and are soldered to the same points.

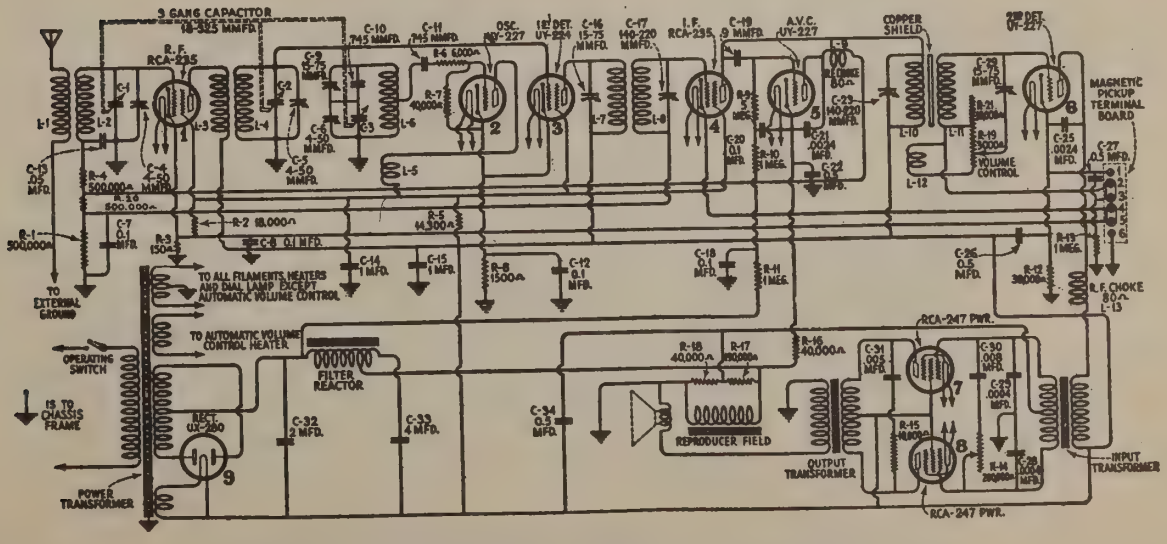


Figure 1—Revised Schematic diagram of late production R-11

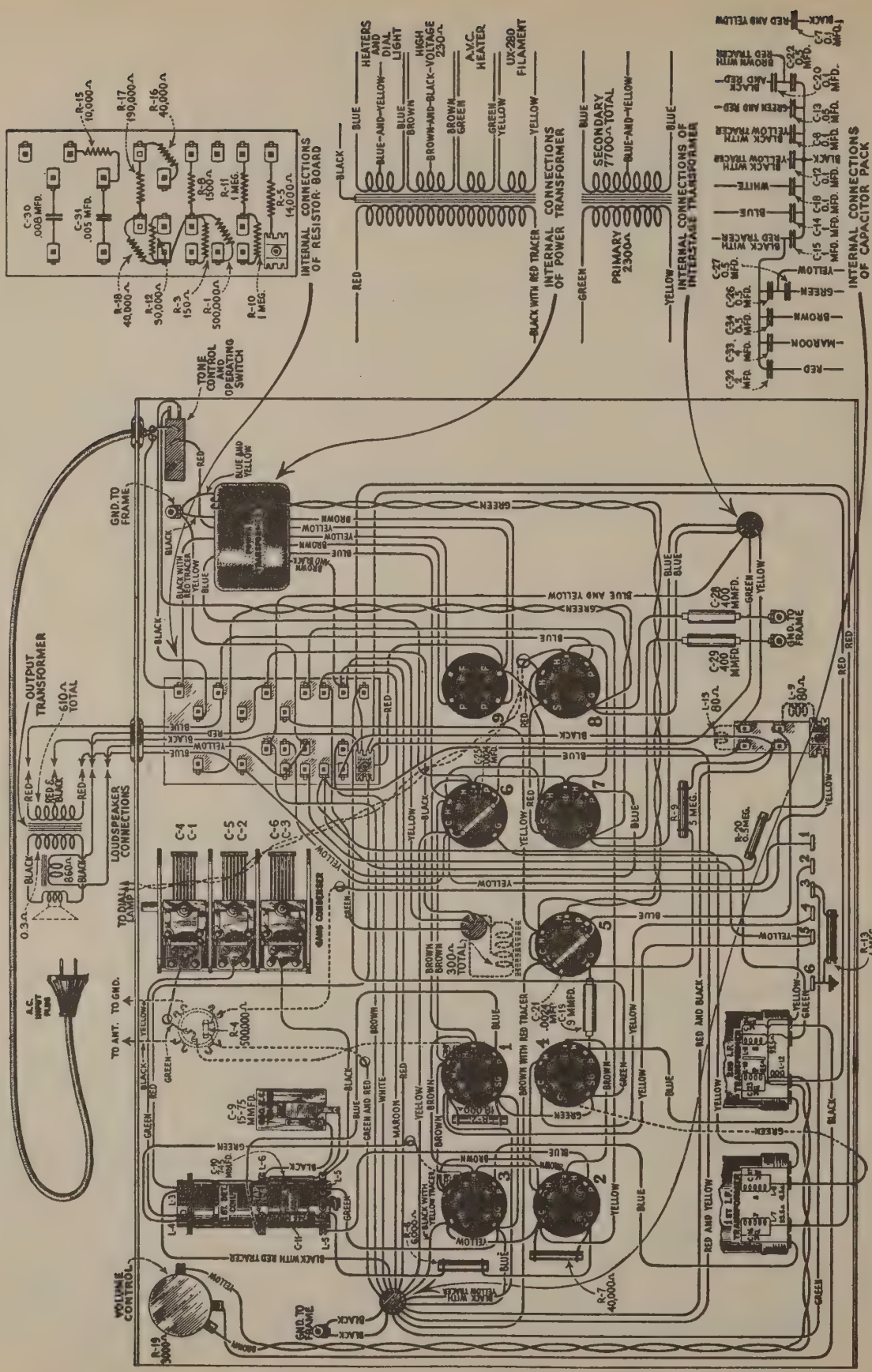


Figure 2—Wiring diagram of late production R-11

SERVICE NOTES

for

RCA Victor Model RE-16

The RCA Victor Model RE-16 is a radio phonograph combination instrument that utilizes the standard RCA Victor Superette chassis and loudspeaker together with the phonograph equipment used in RCA Victor combination instruments. This consists of the low impedance magnetic pickup and inertia type tone arm, induction disc motor, radio-record switch and record volume control. A manually operated automatic switch, similar to that used in the T-5 Electrola is included in the motor and turntable assembly.

Service information, other than that pertaining to replacement parts, may be obtained from Service Notes already issued on the RCA Victor Superette and the RCA Radiola 86.

The schematic wiring diagram is shown in Figure 1 and the assembly wiring in Figure 2. The chassis wiring, with the exception of the power leads added for the phonograph motor, is the same as that shown in the RCA Victor Superette Service Notes.

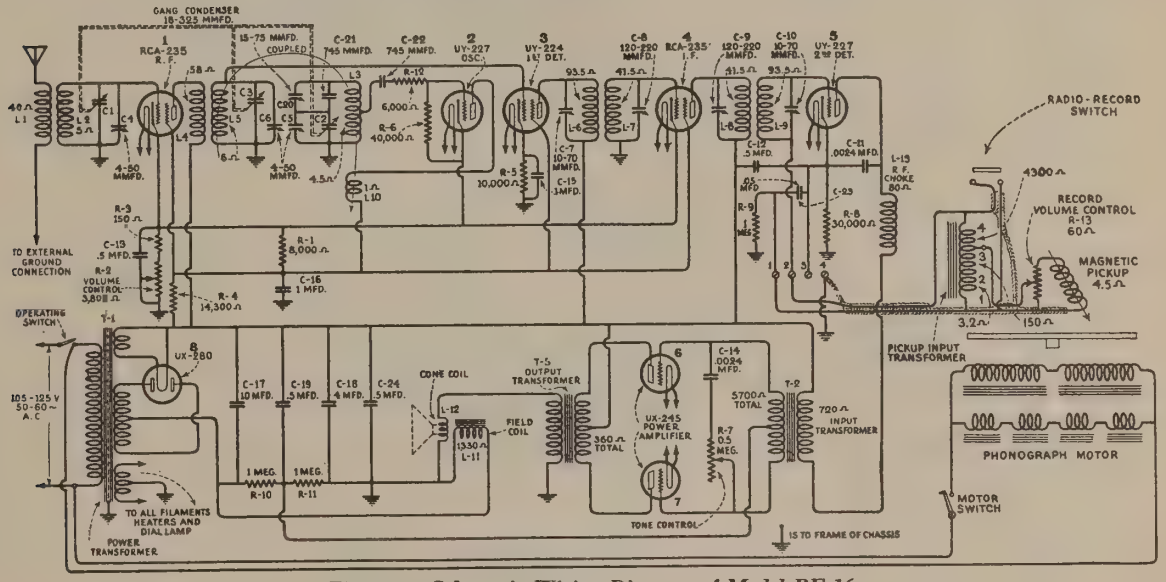


Figure 1—Schematic Wiring Diagram of Model RE-16

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
2614	Switch—Automatic brake switch	$1.40
2620	Cushions—Pickup rubber cushions—Comprising 1 damper and 2 pivot cushions—Package of 1 set	.50
2759	Box—Needle box with lid—Package of 2	.60
2762	Bearing assembly—Governor bearing assembly—Comprising 2 bearings, 2 set screws and 2 steel balls—Package of 3 sets	.50
2763	Bolts assembly—Motor mounting bolts with nuts, washers and rubber cushions—Package of 1 set	1.00
2764	Spindle—Turntable spindle	.80
2765	Screw—Pickup needle screw—Package of 10	.80
2766	Screw—Pickup cover mounting screw—Package of 10	.50
2767	Spring—Pickup magnet spring—Package of 10	.50
2768	Armature—Pickup armature	.50
2769	Coil—Pickup coil	.50
2770	Plate—Pickup damper plate—Package of 5	.50
2771	Screw—Damper plate mounting screw—Package of 10	.50
2772	Magnet—Pickup magnet	2.60
2773	Pole piece—R. H. pole piece	.50
2778	Pole piece—L. H. pole piece	.50
2781	Felt—Regulating lever friction felt—Package of 20	.50
2785	Hinge—Lid hinge with mounting screws—Package of 1 set of 2	.50
2828	Screw assembly—Pickup mounting screw, nut and washer—Package of 10 sets	.60
2829	Knob—Motor board knob and screw—Package of 2	.50
2872	Ball and spring—Governor ball and spring with mounting screws and washers—Package of 5	.75
2873	Screw assembly—Top plate screw assembly—Comprising screw, nut, washer and ball bearing—Package of 5 sets	.50
2875	Knob—Control knob—Package of 5	1.50
3020	Escutcheon—Control panel escutcheon with mounting screws	.60
3052	Screw assembly—Pickup pole piece mounting screw, nut and washer—Package of 10 sets	.50
3100	Control—Record volume control—Complete with mounting nut and washer—Less knob	1.50
3101	Switch—Toggle switch with mounting washer and nuts	1.25
3102	Receptacle—Needle box receptacle	$0.75
7077	Regulator—Speed regulator escutcheon and screw—Complete with mounting screws—Package of 2	.60
7082	Support—Lid support with mounting screws	2.00
7083	Transformer—Input transformer with mounting screws	5.00
7084	Cover—Turntable cover	.50
7085	Pickup—Pickup unit complete	12.50
7086	Lever—Regulating lever with friction felt—Package of 2	.50
7087	Gear—Governor drive gear with set screw	.50
7088	Disc—Rotor disc	4.00
7089	Governor—Governor complete with spindle	2.50
7090	Inductor—Inductor coil—60 cycles—110 Volts	10.00
7093	Cover—Pickup cover	.50
7151	Back—Pickup housing back	.50
7247	Cable—Main cable	2.50
7248	Inductor—Inductor coil—220 Volts	15.00
7249	Ornament—Front top rail ornament	1.00
8582	Turntable—Turntable with cover	3.00
8675	Arm—Pickup suspension arm and base	3.50
8676	Leg—Cabinet leg	1.50
8677	Foot—Cabinet foot with ferrule	.75
8678	Baffle—Baffle board with grille cloth	1.50
9360	Cabinet—Complete less all apparatus	75.00
9361	Panel—Control panel	12.00
9362	Stretcher	4.00
9363	Lid—Cabinet lid	6.00
10129	Ball—Steel ball bearing—$\frac{1}{8}$"—Package of 20	.50
10174	Springs—Automatic springs—Set of 4 springs—Package of 2 sets of 4 springs	.50
10175	Holder—Needle holder with mounting screws	.70
10181	Brake—Automatic brake complete less contact switch with mounting screws	2.50
10196	Spring—Regulating shaft spring—Package of 10	.50
10378	Plate—Top plate	5.00
10266	Disc—Rotor disc—For 220 Volt Motor	4.00

FOR RADIO PARTS SEE RCA VICTOR SUPERETTE R-7 SERVICE NOTES

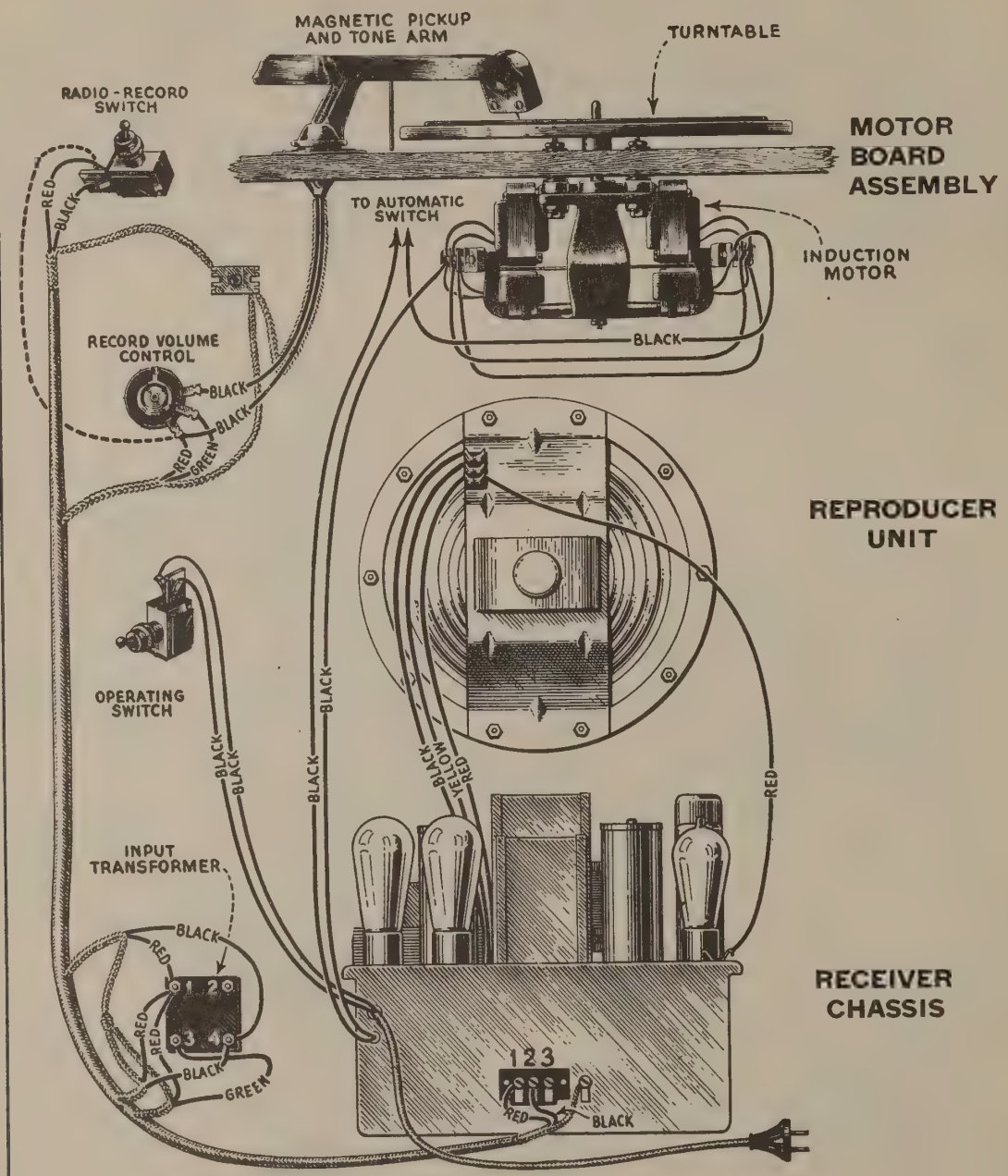

MAGNETIC PICKUP AND TONE ARM
TURNTABLE
RADIO - RECORD SWITCH
MOTOR BOARD ASSEMBLY
TO AUTOMATIC SWITCH
INDUCTION MOTOR
RECORD VOLUME CONTROL
REPRODUCER UNIT
OPERATING SWITCH
INPUT TRANSFORMER
RECEIVER CHASSIS
DOTTED LINE INDICATES CONNECTIONS OF MODELS NOT HAVING RED LEAD FROM SWITCH TO TERMINAL No. 1 OF INPUT TRANSFORMER.

Figure 2—Assembly Wiring Diagram of Model RE-16

International Division

RCA Victor Company, Inc.

Camden, N. J., U. S. A.

SERVICE NOTES

for

RCA Victor Model RE-16A

The RCA Victor Model RE-16A is a radio phonograph combination instrument that utilizes the standard RCA Victor R-7A chassis and loudspeaker together with the phonograph equipment used in RCA Victor combination instruments. This consists of the low impedance magnetic pickup and inertia type tone arm, induction disc motor, radio-record switch and record volume control. A manually operated automatic switch. similar to that used in the T-5 Electrola is included in the motor and turntable assembly.

Service information, other than that pertaining to replacement parts, may be obtained from Service Notes already issued on the RCA Victor R-7A and the RCA Radiola 86.

The schematic wiring diagram is shown in Figure 1 and the assembly wiring in Figure 2. The chassis wiring, with the exception of the power leads added for the phonograph motor, is the same as that shown in the RCA Victor R-7A Service Notes.

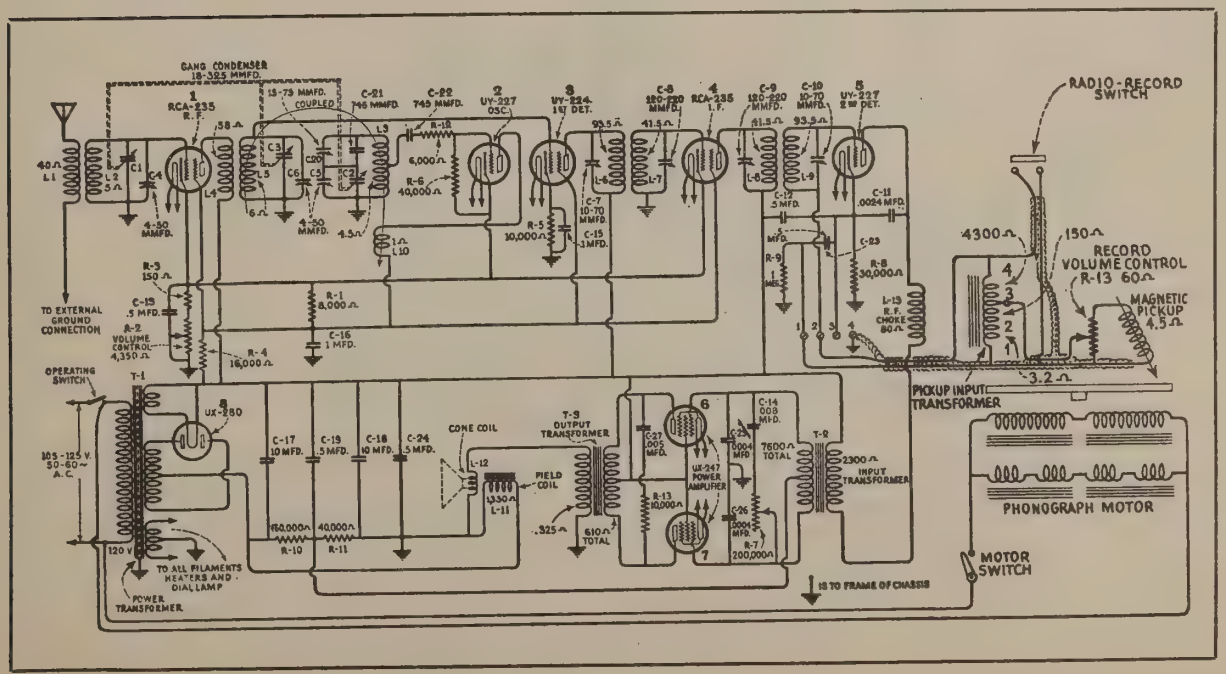


Figure 1—Schematic Wiring Diagram of Model RE-16A

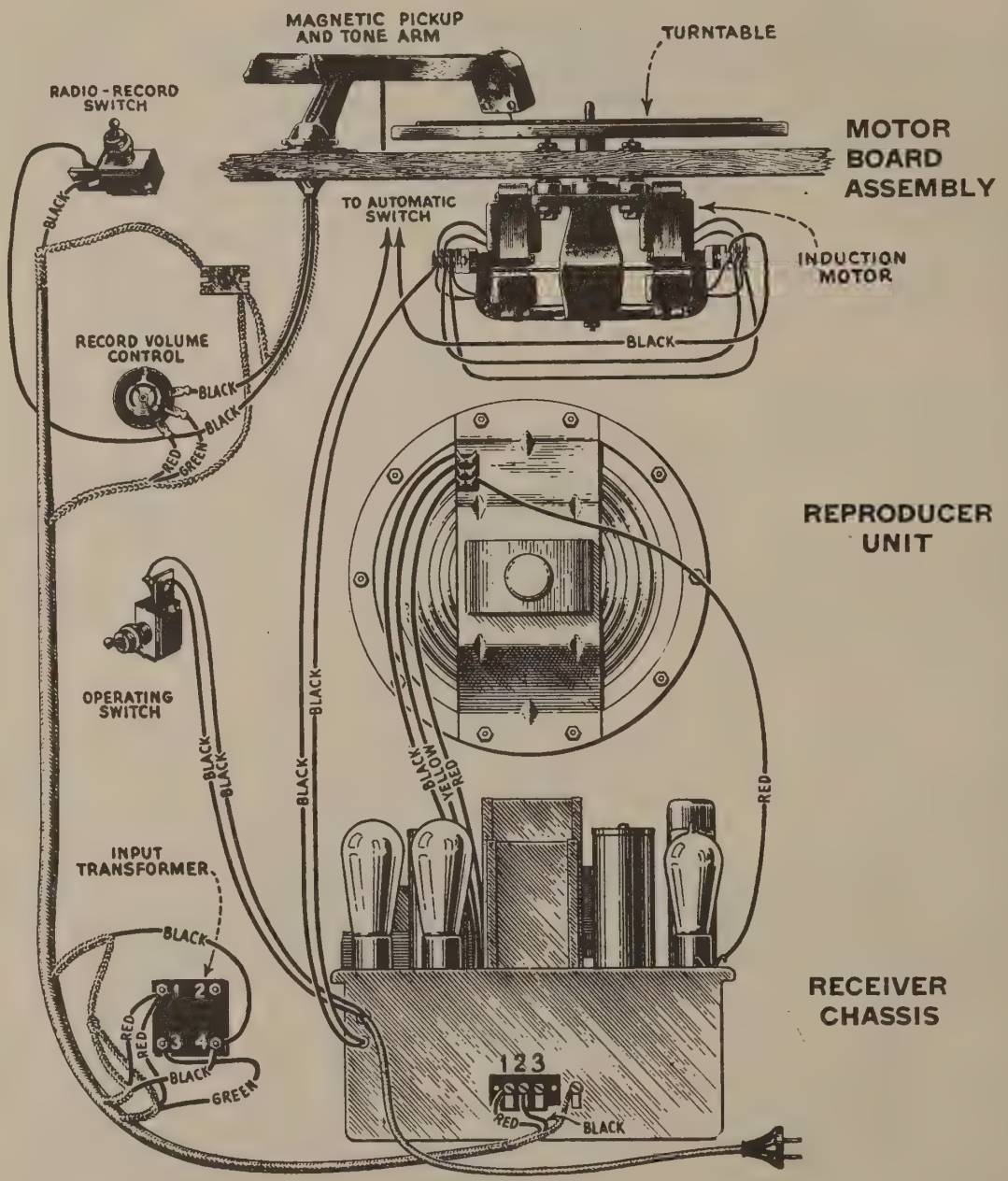


Figure 2—Assembly Wiring Diagram of Model RE-15A

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
	RECEIVER ASSEMBLY	
2563	Resistor—6000 ohms—Carbon type—1 watt—Package of 5	$3.00
2734	Capacitor—745 mmfd.—Package of 5	2.20
2745	Screw—Adjusting condenser screw for No. 7062—Package of 10	.50
2746	Socket—Dial lamp socket	.50
2747	Cap—Grid contactor cap—Package of 5	.50
2749	Capacitor—2400 mmfd.	1.50
2875	Knob—Tuning volume control or tone control knob—Package of 5	1.50
2881	Bracket—Dial lamp bracket—Package of 5	.50
2882	Socket—UY Radiotron socket—7 used	.50
2957	Capacitor—10 mfd. electrolytic capacitor	3.00
2963	Resistor—8000 ohms—Carbon—1 watt—Package of 5	2.50
2968	Socket—UX Radiotron socket—1 used	.50
2973	Board—Magnetic pickup terminal board	.50
2991	Transformer—1st intermediate transformer	3.00
2992	Transformer—2nd intermediate transformer	3.00
2994	Coil—2nd detector plate coil—Complete with mounting rivet	.60
2995	Volume control—Complete less knob—Package of 5	6.00
2997	Coil—R. F. coil—Complete with mounting nuts and washers	1.90
2998	Coil—1st detector and oscillator coil—Complete with mounting nuts and washers	2.40
2999	Drive shaft—Tuning dial drive shaft with mounting screws and washers	.50
3000	Scale—Dial scale and drum with set screws	.60
3003	Cushions—Sponge rubber chassis support cushions—Package of 4	.50
3056	Shield—Radiotron shield—3 used—Package of 2	.50
3060	Resistor—40,000 ohms—Carbon—1 watt—Package of 5	2.50
3062	Board—Loudspeaker terminal board—Package of 3	.50
3076	Resistor—1 megohm—Carbon—½ watt—Package of 5	2.50
3077	Resistor—30,000 ohms—Carbon—½ watt—Package of 5	2.50
3078	Resistor—10,000 ohms—Carbon—½ watt—Package of 5	2.50
3079	Resistor—40,000 ohms—Carbon—½ watt—Package of 5	2.50
3080	Resistor—160,000 ohms—Carbon—½ watt—Package of 5	2.50
3081	Resistor—16,000 ohms—Carbon—3 watts	.60
3082	Board—Resistor board—Complete, less resistors, coil and capacitor	1.00
3084	Capacitor—0.008 mfd. for tone control	.70
3085	Capacitor—400 mmfd.	.60
3093	Tone control—Tone control and operating switch—Complete, less knob	1.90
7054	Cord—Power cord	1.00
7062	Capacitor—Adjustable oscillator trimming capacitor—15-70 mmfd.	1.00
7241	Capacitor—3 gang tuning capacitor	8.00
7255	Transformer—Interstage audio transformer	4.50
7256	Capacitor pack—Comprising one 0.005 mfd., five 0.5 mfd., one 1.0 mfd. and one 1.0 mfd. capacitor in metal container	3.50
8570	Shield—Intermediate transformer shield	.60
8654	Transformer—Power transformer—220 volts, 50-60 cycles	11.00
8679	Transformer—Power transformer—105-125 volts, 50-60 cycles	9.00
7413	Screw assembly—Speaker mounting screw assembly—Comprising 2 plates, 2 bolts, 2 lock washers and 2 nuts—Package of 1 set	.50
8559	Ring—Cone retaining ring	.80
8601	Cone—Speaker paper cone—Package of 5	15.00
8653	Coil—Speaker field coil assembly—Comprising field coil, magnet and cone support	5.00
	MOTOR BOARD ASSEMBLY	
2614	Switch—Automatic brake switch	1.40
2620	Cushions—Pickup rubber cushions—Comprising 1 damper and 2 pivot cushions—Package of 5 sets	1.25
2759	Box—Needle box with lid—Package of 2	$0.60
2762	Bearing assembly—Governor bearing assembly—Comprising 2 bearings, 2 set screws and 2 steel balls—Package of 3 sets	50
2763	Bolt assembly—Motor mounting bolts with nuts, washers and rubber cushions—Package of 1 set	1.00
2764	Spindle—Turntable spindle	.80
2765	Screw—Pickup needle screw—Package of 10	.80
2766	Screw—Pickup cover mounting screw—Package of 10	.50
2767	Spring—Pickup magnet spring—Package of 10	.50
2768	Armature—Pickup armature	.50
2770	Plate—Pickup damper plate—Package of 5	.50
2771	Screw—Damper plate mounting screw—Package of 10	.50
2772	Magnet—Pickup magnet	2.60
2773	Pole shoe—R. H. pole shoe	.50
2778	Pole shoe—L. H. pole shoe	.50
2781	Felt—Regulating lever friction felt—Package of 20	.50
2828	Screw assembly—Pickup mounting screw, nut and washer—Package of 10 sets	.60
2829	Knob—Motor board knob and screw—Package of 2	.50
2872	Ball and spring—Governor ball and spring with mounting screws and washers—Package of 5	.75
2873	Screw assembly—Top plate screw assembly—Comprising screw, nut, lock washer and ball bearing—Package of 5 sets	.50
3052	Screw assembly—Pickup pole shoe mounting screw, nut and washer—Package of 10 sets	.50
3102	Receptacle—Tungstone needle box receptacle	.75
6118	Coil—Pickup coil	.50
7077	Regulator—Speed regulator escutcheon and screw—Complete with mounting screws—Package of 2	.60
7078	Volume control—Record volume control—Complete with mounting nut and washer—Less knob	1.50
7083	Transformer—Input transformer	5.00
7084	Cover—Turntable cover	.50
7086	Lever—Regulating lever with friction felt—Package of 2	.50
7087	Gear—Governor drive gear with set screw	.50
7088	Disc—Rotor disc	4.00
7090	Inductor—Inductor coil—110 volts, 60 cycles	10.00
7093	Cover—Pickup cover	.50
7151	Back—Pickup housing back	.50
7247	Cable—Main cable	2.50
7248	Inductor—Inductor coil—220 volts	15.00
7412	Pickup—Pickup unit complete	12.50
8582	Turntable—Turntable with cover	3.00
8675	Arm—Pickup suspension arm and base	3.50
10129	Ball—Steel ball bearing—$\frac{3}{16}$"—Package of 20	.50
10174	Spring—Automatic brake springs—Set of 4 springs—Package of 2 sets	.50
10175	Holder—Needle holder with mounting screws	.70
10181	Brake—Automatic brake—Complete, less contact switch No. 2614	2.50
10196	Spring—Regulating shaft spring—Package of 10	.50
10266	Disc—Rotor disc—For 220 volt motor	4.00
10289	Governor—Governor complete with spindle	2.50
10378	Plate—Top plate	5.00
	CABINET ASSEMBLY	
2785	Hinge—Lid hinge with mounting screws—Package of 2	.50
3020	Escutcheon—Control panel tuning dial escutcheon—Complete with mounting screws	.60
7082	Support—Lid support with mounting screws	2.00
7249	Ornament—Front top rail ornament	1.00
8676	Leg	1.50
8677	Foot—Cabinet foot with ferrule	.75
8678	Baffle board and grille cloth	1.50
9361	Control panel	12.00
9362	Stretcher	4.00
9363	Lid	6.00
9400	Cabinet—Cabinet complete, less equipment	75.00

International Division
RCA Victor Company, Inc.
Camden, N. J., U. S. A.

SERVICE NOTES

for

RCA Victor Radiola Electrola, RE-18

The RCA Victor Radiola Electrola RE-18 is a nine tube radio receiver combined with the RCA Victor Electrola equipment. Features of the radio receiver are, nine tube super-heterodyne radio receiver providing excellent sensitivity, selectivity, tone quality, a new type automatic volume control that is quiet between stations and push-pull Pentode output Radiotrons. New motor board equipment having a synchronous motor and the famous RCA Victor Inertia tone arm is used. The motor is fitted with a speed reducing gear that allows for the playing of both standard and Program Transcription records.

SERVICE DATA

A reference to the RCA Victor R-11 Service Notes will give the details of any service work required on the receiver assembly or loudspeaker. The details of service work on the magnetic pickup are covered in the Radiola 86 Service Notes. Figure 1 shows schematic diagram and Figure 2 the assembly wiring. The replacement parts are listed below.

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
	RECEIVER ASSEMBLY	
2563	Resistor—6,000 ohms—Carbon type—Package of 5	$3.00
2730	Resistor—18,000 ohms—Carbon type—Package of 5	2.00
2734	Capacitor—745 mmfd.—Package of 5	2.20
2746	Socket—Dial lamp socket	.50
2747	Contact cap—Package of 5	.50
2749	Capacitor—2400 mmfd.	1.50
2875	Knobs—Package of 5	1.50
2882	Socket—UY Radiotron socket—Complete with insulating shield—8 used	.50
2968	Socket—UX Radiotron socket—Complete with insulating sheild—1 used	.50
2999	Shaft—Dial drum drive shaft	.50
3029	Indicator—Tuning dial indicator—Complete with bracket	.50
3046	Resistor—190,000 ohms—Carbon type—Package of 5	2.50
3047	Resistor—1500 ohms—Carbon type—Package of 5	2.50
3048	Resistor—500,000 ohms—Carbon type—Package of 5	2.50
3049	Resistor—150 ohms—Carbon type—Package of 5	2.50
3050	Resistor—14,000 ohms—Carbon type—Package of 1	.60
3051	Resistor—5 megohm—Carbon type—Package of 5	2.00
3053	Capacitor—9 mmfd.—Package of 2	.50
3055	Cushion—Chassis support cushion—Package of 4	.50
3056	Shield—Radiotron shield—6 used—Package of 2	.50
3076	Resistor—1 megohm—Carbon type—Package of 5	2.50
3077	Resistor—30,000 ohms—Carbon type—Package of 5	2.50
3078	Resistor—10,000 ohms—Carbon type—Package of 5	2.50
3079	Resistor—40,000 ohms—Carbon type—Package of 5	$2.50
3085	Capacitor—400 mmfd.	.60
3089	Terminal board—Magnetic pickup terminal board	.50
3090	Board—A. V. C. and 2nd detector R. F. choke mounting board—Less choke coils	.50
3091	Board—Resistor board—Less resistor and capacitors	1.00
3092	Volume control—Complete with mounting nut	1.50
3093	Tone control—Complete with mounting nut	1.90
3094	Shield—Radiotron shield—1 used—Package of 2	.50
3095	Coil—R. F. coil—Complete with mounting bracket	1.90
3096	Coil—1st detector and oscillator coil—Complete with mounting bracket	3.55
3097	Scale—Dial drum scale with set screws—Package of 2	.50
3098	Capacitor—0.008 mfd.	.50
3099	Capacitor—0.005 mfd.	.75
7054	Cord—Power cord	1.00
7062	Capacitor—Adjustable oscillator trimmer capacitor—15-70 mmfd.	1.00
7241	Capacitor—3 gang tuning capacitor with mounting screws and washers	8.00
7266	Transformer—1st intermediate transformer	3.00
7267	Transformer—2nd intermediate transformer	3.00
7268	Coil—Detector or A. V. C. R. F. choke coil—Complete with mounting rivet	.60
7269	Capacitor pack—In metal container—60 cycle	7.25
7270	Reactor—Filter reactor	4.00

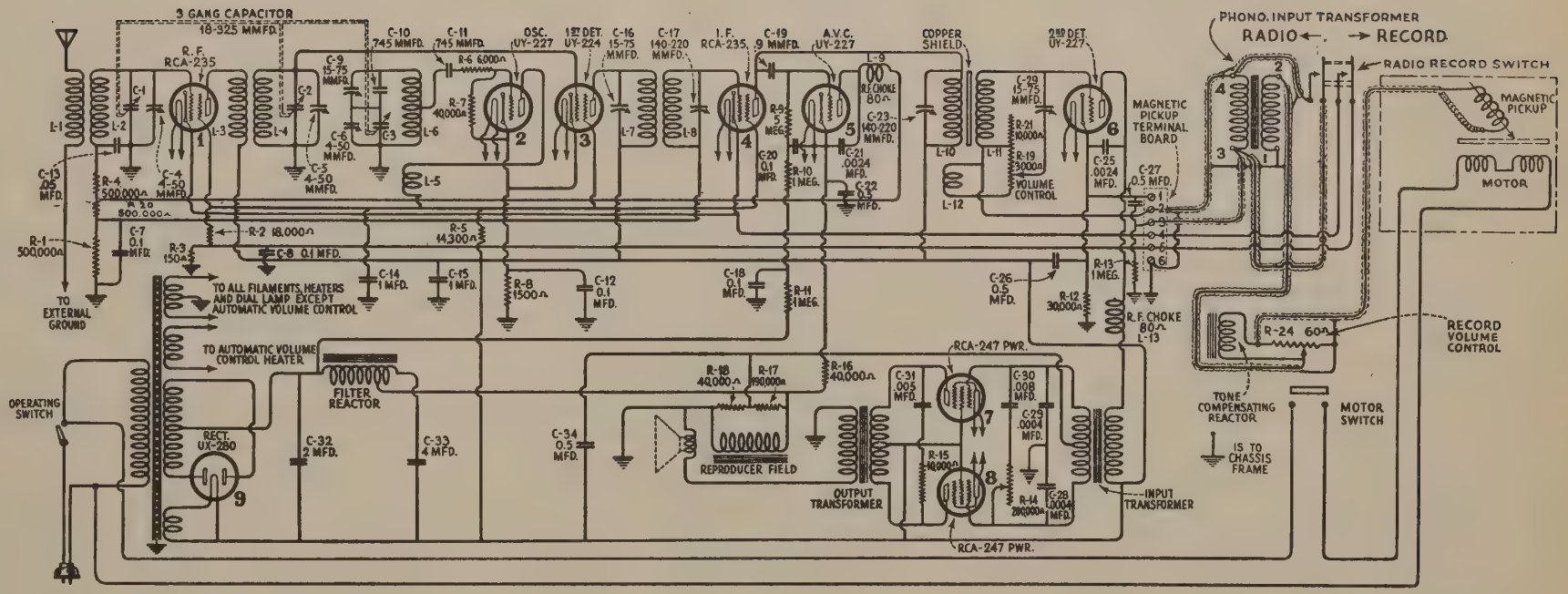


Figure 1—Schematic Circuit Diagram of RE-18

REPLACEMENT PARTS (Continued)

Stock No.	DESCRIPTION	List Price
7271	Transformer—Interstage transformer	$4.25
7272	Transformer—Power transformer—105–125 volts, 50–60 cycles	12.00
7273	Capacitor pack—By-pass capacitor pack—25–40 cycles	10.00
7274	Transformer—Power transformer—105–125 volts, 25–40 cycles	15.00
7275	Transformer—Power transformer—220 volts, 50–60 cycles	10.00
	LOUDSPEAKER ASSEMBLY	
3237	Speaker mounting screw assembly—Comprising 4 screws, 4 washers, 4 nuts and 4 eyelets—Package of 1 set	.50
7257	Coil—Cone support with retaining ring, magnet and field coil	6.00
7258	Transformer—Output transformer	1.70
8559	Ring—Cone retaining ring	.80
8601	Cone—Cone with voice coil—Package of 5	15.00
	MOTOR BOARD ASSEMBLIES	
X13	Board—Motor board	5.85
2614	Switch—Automatic brake switch	1.40
2615	Spring—Automatic brake springs—Set of 4—Package of 2 sets	.50
2620	Cushions—Pickup rubber cushions comprising 2 pivots and 1 damper cushion—Package of 5 sets	1.25
2765	Screw needle holding screw—Package of 10	.80
2766	Screw—Pickup cover mounting screw—Package of 10	.50
2767	Spring—Pickup magnet retaining spring—Package of 10	.50
2768	Armature—Pickup armature	.50
2769	Coil—Pickup coil	.50
2770	Plate—Pickup damper plate complete—Package of 5	.50
2771	Screw—Pickup damper plate mounting screw—Package of 10	.50
2774	Trip rod—Pickup arm trip rod with mounting nut—Package of 5	.50
2908	Spring—Shift lever and pawl carrier spring—Package of 10	.50
3052	Screw assembly—Pickup pole shoe mounting screw, nut and washer—Package of 10 sets	.50
3157	Gear—Driving gear—Located on turntable spindle above top plate	1.00
3159	Friction brake—Gear reducing friction brake spring with mounting rivet and pad—Package of 4	2.00
3160	Escutcheon—Speed escutcheon plate with mounting screws—Package of 2	.90
3167	Magnet—Pickup magnet	2.60
3169	Pole shoe—R.H. pole shoe	1.45
3170	Pole shoe—L.H. pole shoe	1.45
3211	Washer—Turntable spindle leather washer—Package of 10	.50
3224	Switch—Radio-Record changeover switch with mounting nut and washer	1.35
3278	Bearing—Fibre rotor shaft thrust bearing and cork button—Package of 10	.50
3279	Screw and Nut—Rotor shaft thrustbearing adjusting screw and lock nut—Package of 10	.50
3280	Washer—Metal washer located on turntable underneath gear reducing unit—Package of 20	.50
3281	Pawl—Gear reducing pawl with mounting stud	.50
6119	Motor hanging stud—Package of 6	.50
6120	Screw—For holding turntable spindle bearing—Package of 10	.50
6121	Bearing—Turntable spindle bearing and grease cap	$1.10
7093	Cover—Pickup cover	.50
7151	Back—Pickup housing back	.50
7180	Brake—Automatic brake complete	3.40
7305	Gear—Reducing unit complete	4.50
7332	Cable—Main cable from receiver to input transformer radio-record switch and volume control	2.30
7387	Reactor—Tone compensating reactor with mounting bracket	.85
7388	Spindle—Turntable spindle with fibre gear—60 cycle	6.00
7389	Rotor and shaft—60 cycles	9.00
7390	Motor mounting washers and springs—Comprising 3 "C" washers, 9 cup washers, 6 springs and 3 flat washers—Package of 1 set	.75
7391	Volume control—Record volume control with mounting nut and washer	1.35
7392	Holder—Needle holder	.75
7393	Block—Pickup connector block and wire	.90
7394	Pickup—Unit complete	12.50
7400	Turntable spindle and gear—25 cycles	8.00
7401	Rotor and shaft—25 cycles	10.00
7402	Turntable spindle and gear—30 cycles	8.00
7403	Rotor and shaft—30 cycles	10.00
7414	Top plate—Top plate with two bronze rotor shaft bearings	3.50
7415	Field and field coils—50–60 cycles—Assembled	6.25
7416	Field and field coils—25–30 cycles—Assembled	7.00
8731	Lever—Shift lever assembly complete	1.60
8795	Motor—Motor complete—60 cycles	19.85
8796	Arm—Pickup arm complete less pickup unit	6.00
8800	Motor—Motor complete—25 cycles	24.65
8801	Motor—Motor complete—30 cycles	24.65
10184	Plate—Automatic brake trip plate with mounting screws—Package of 5	.60
	MISCELLANEOUS	
2759	Box—Needle box with lid—Package of 2	.60
3102	Receptacle for Tungstone needle boxes	.75
7084	Turntable covering	.50
7312	Transformer—Input transformer	6.55
8733	Turntable with cover	4.60
	CABINET	
X14	Baffle board and grille cloth	1.30
X15	Escutcheon—Tuning dial escutcheon	1.45
X16	Stretcher	4.70
X17	Foot	1.00
X18	Leg	3.55
X19	Lid	12.00
X20	Control Panel	7.10
X21	Overlay—Front top rail end overlay R.H. or L.H.	1.25
X22	Overlay—Front top rail center overlay	2.65
X23	Mouldings—Control panel mouldings—1 set	1.60
2785	Hinge—Cabinet lid hinge with mounting screws—Package of 2	.50
3156	Label—Metal trade mark label—Package of 5	2.50
7082	Support—Lid support	2.00
7395	Support—Screen support	.50
9397	Cabinet—Cabinet complete less equipment	74.50
10901	Spring—Lid support spring—Package of 2	.50

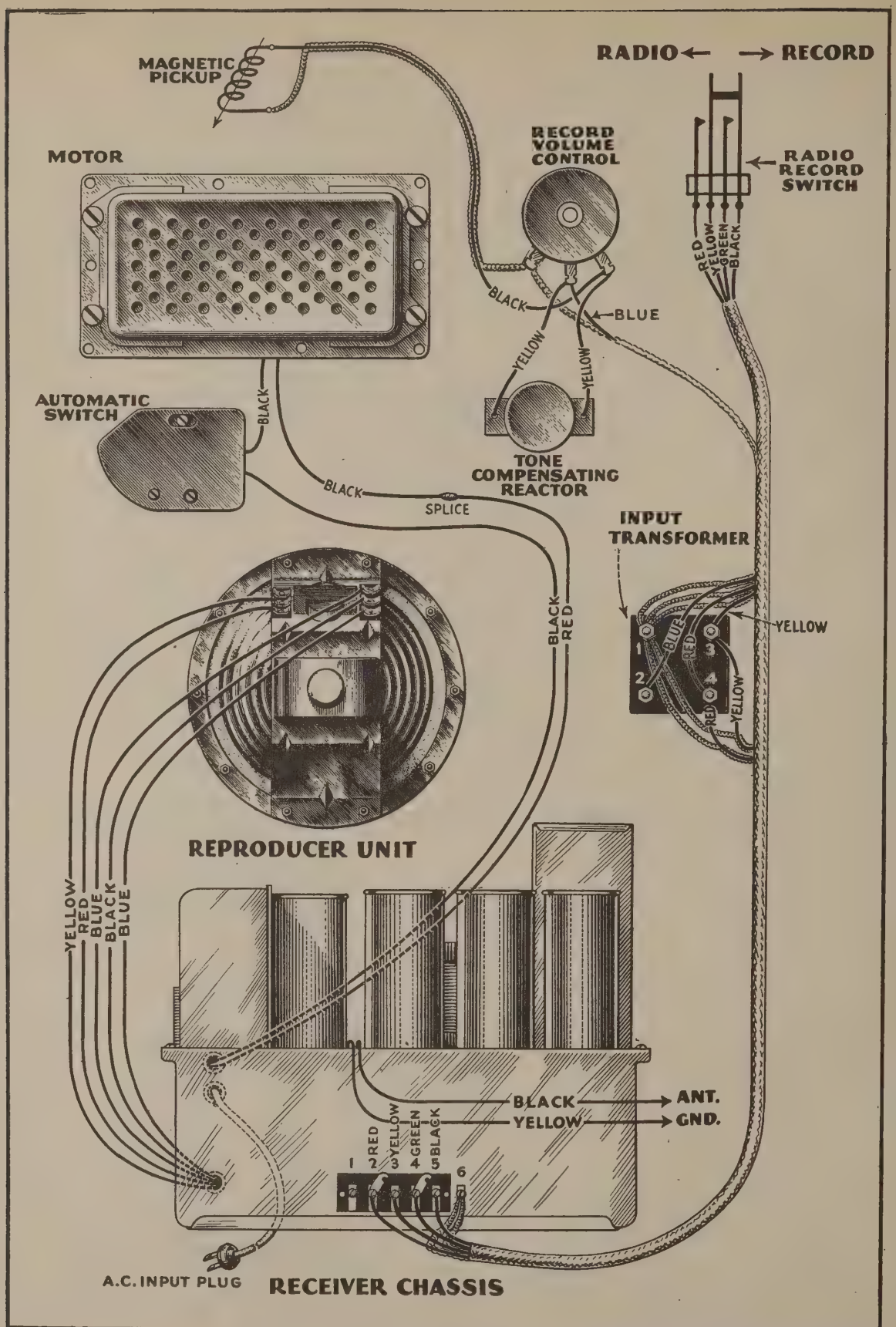


Figure 2—Assembly Wiring Diagram of RE-18

SERVICE NOTES
for
RCA Victor Radiola Electrola RE-18A

ELECTRICAL SPECIFICATIONS

Voltage Rating.....105–125 Volts
Frequency Rating.....25, 30, 50 and 60 Cycles
Power Consumption.....25, 30 and 50 Cycles 170 Watts, 60 Cycles 160 Watts
Type of Circuit.....Super-Heterodyne using Super-Control Radiotrons and Push-pull Pentode output stage.
Type and Number of Radiotrons...2 RCA-235, 3 UY-227, 1 UY-224, 1 UX-280, 2 RCA-247—Total, 9
Number of Radio Frequency Stages.....1
Type of First Detector..Tuned Input Grid Bias
Number of Intermediate Stages.....1
Type of Second Detector.....Power Grid Bias
Type of Automatic Volume Control....UY-227 Controlled by signal voltage in turn controlling bias on R. F. and I. F. tubes
Type of Manual Volume Control.....Potentiometer used to regulate input to second detector
Type of Tone Control....Variable resistance in series with capacitor connected across grids of output stage. Capacitor tunes transformer at "low" position
Number of Audio Stages (Radio).....1
Number of Audio Stages (Phonograph).....2
Type of Magnetic Pick-up.....Low Impedance
Type of Tone Arm.....Inertia
Diameter of Turntable.....12 inches
Type of Rectifier.....Full Wave
Type of Loudspeaker.....8" Electro-Dynamic
Undistorted Output.....4.0 Watts

PHYSICAL SPECIFICATIONS

Height.....43½ inches
Depth.....15$\frac{23}{32}$ inches
Width.....25⅝ inches
Weight Alone.....97 lbs.
Weight Packed for Shipment.....141 lbs.

RCA Victor Radiola Electrola RE-18A is a nine-tube combination super-heterodyne radio receiver and electric phonograph. Except for the cabinet and tuning dial, the RE-18A is similar to the RE-18. A reference to the RE-18 service notes should be made for information relative the circuits and similar data. The replacement parts are listed below.

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
	RECEIVER ASSEMBLY	
2563	Resistor—6,000 ohms—Carbon type—1 watt—Package of 5	$3.00
2730	Resistor—18,000 ohms—Carbon type—1 watt—Package of 5	2.00
2734	Capacitor—745 mmfd.—Package of 5	2.20
2746	Socket—Dial lamp socket	.50
2747	Cap—Grid contactor cap—Package of 5	.50
2749	Capacitor—2400 mmfd.	1.50
2875	Knob—Tuning control, volume control or tone control knob—Package of 5	1.50
2882	Socket—Five contact Radiotron socket complete with insulator—8 used	.50
2963	Resistor—8,000 ohms—Carbon type—1 watt—Package of 5	2.50
2968	Socket—Four contact Radiotron socket complete with insulator—1 used	.50
3024	Capacitor—9 mmfd.—Package of 2	.50
3046	Resistor—190,000 ohms—Carbon type—½ watt—Package of 5	2.50
3047	Resistor—1,500 ohms—Carbon type—½ watt—Package of 5	2.50
3048	Resistor—500,000 ohms—Carbon type—½ watt—Package of 5	2.50
3049	Resistor—150 ohms—Carbon type—½ watt—Package of 5	2.50
3050	Resistor—14,000 ohms—Carbon type—3 watt	.60
3055	Cushion—Receiver chassis sponge rubber cushion—Package of 4	.50
3056	Shield—Radiotron shield—6 used—Package of 2	$0.50
3076	Resistor—1 megohm—Carbon type—½ watt—Package of 5	2.50
3077	Resistor—30,000 ohms—Carbon type—½ watt—Package of 5	2.50
3078	Resistor—10,000 ohms—Carbon type—½ watt—Package of 5	2.50
3079	Resistor—40,000 ohms—Carbon type—½ watt—Package of 5	2.50
3085	Capacitor—400 mmfd.	.60
3089	Board—Terminal board complete with 5 terminals	.50
3091	Board—Resistor board complete less resistors and capacitors	1.00
3092	Volume control—Volume control complete with mounting nut	1.50
3093	Tone control—Tone control complete with mounting nut	1.90
3095	Coil—R. F. coil	1.90
3096	Coil—1st detector and oscillator coil complete with mounting bracket	3.55
3098	Capacitor—0.008 mfd.	.50
3099	Capacitor—0.005 mfd.	.75
6179	Terminal—Single ground terminal with screw complete with mounting rivet—Package of 5	.50
6188	Resistor—2 megohm—Carbon type—½ watt—Package of 5	2.00
6189	Bracket—Dial lamp bracket and indicator—Package of 2	.65
6190	Shaft—Tuning dial shaft complete with 3 washers—Package of 5	.85

REPLACEMENT PARTS—Continued

Stock No.	DESCRIPTION	List Price
	RECEIVER ASSEMBLY—Continued	
6191	Cord—Condenser drum drive cord—Package of 5	$0.55
6192	Spring—Condenser drum drive cord tension spring—Package of 10	.50
7054	Cord—Power cord	1.00
7062	Capacitor—Adjustable capacitor—15–70 mmfd.	1.00
7266	Transformer—1st intermediate transformer	3.00
7267	Transformer—2nd intermediate transformer	3.00
7268	Coil—Detector choke coil complete with mounting rivet	.60
7269	Capacitor—Comprising one 2.0 mfd., one 4.0 mfd., four 0.5 mfd., two 1.0 mfd., five 0.1 mfd. and one 0.05 mfd. capacitor in metal container	7.25
7270	Reactor—Filter reactor	4.00
7271	Transformer—Interstage transformer	4.25
7272	Transformer—Power transformer—105–125 volts, 50–60 cycles	12.00
7273	Capacitor—Comprising one 4.0 mfd., one 6.0 mfd., four 0.5 mfd., two 1.0 mfd., five 0.1 mfd., and one 0.05 mfd. capacitors in metal container	10.00
7274	Transformer—Power transformer—105–125 volts—25–40 cycles	15.00
7275	Transformer—Power transformer—220 volts—50–60 cycles	10.00
7438	Capacitor—Variable tuning capacitor	5.20
7439	Drum—Tuning condenser drive drum with set screw—Complete with 3 dial scale mounting nuts	.50
7440	Scale—Dial and dial scale	.75
8871	Support—Receiver chassis metal mounting support—Package of 4	.75
	LOUDSPEAKER ASSEMBLY	
3237	Speaker mounting screw assembly—Comprising 4 screws, 8 washers, 8 nuts and 4 eyelets—Package of 1 set	.50
7257	Coil assembly—Comprising field coil, cone bracket and magnet	6.00
8559	Ring—Cone retaining ring	.80
8601	Cone—Speaker paper cone—Package of 5	15.00
	MOTOR BOARD ASSEMBLY	
X-13	Board—Motor board less equipment	5.85
2614	Switch—Automatic brake switch	1.40
2620	Cushion—Pickup rubber cushions—Comprising 1 damper and two pivot cushions—Package of 5 sets.	1.25
2767	Spring—Pickup magnet retaining spring—Package of 10	.50
2768	Armature—Pickup armature	.50
2770	Plate—Pickup damper plate—Package of 5	.50
2771	Screw—Pickup damper plate mounting screw—Package of 10	.50
2875	Knob—Volume control and record-radio switch knob—Package of 5	1.50
2908	Spring—Pawl carrier spring—Package of 10	.50
3052	Screw assembly—Pickup pole shoe mounting screw assembly—Comprising screw, nut and washer—Package of 10 sets	.50
3157	Gear—Driving gear—Located on turntable spindle above top plate	1.00
3159	Friction brake—Gear reducing friction brake spring with pad—Complete with mounting rivet—Package of 4	2.00
3161	Spring—Shift lever spring—Package of 5	1.20
3167	Magnet—Pickup magnet	2.60
3169	Pole shoe—Pickup pole shoe—R. H.	1.45
3170	Pole shoe—Pickup pole shoe—L. H.	1.45
3205	Screw—Pickup needle holding screw—Package of 10	.80
3207	Screw—Pickup cover mounting screw—Package of 10	.50
3208	Screw assembly—Pickup mounting screw assembly—Comprising screw, nut and washer—Package of 10	.60
3211	Washer—Turntable spindle leather washer—Package of 10	.50
3224	Switch—Record-Radio switch complete with mounting nut and washer	1.35
3278	Bearing—Rotor shaft fibre thrust bearing and cork button—Package of 10	.50
3279	Screw and nut—Rotor shaft thrust bearing adjusting screw and nut—Package of 10	.50
3280	Washer—Metal washer—Located on turntable spindle underneath gear reducing unit—Package of 20	.50
3281	Pawl—Gear reducing pawl with mounting stud	.50
6119	Stud—Motor hanging stud—Package of 6	$0.50
6120	Screw—For holding turntable spindle bearing and grease cap—Package of 10	.50
6121	Bearing—Turntable spindle bearing and grease cap	1.10
6215	Escutcheon—Shift lever speed escutcheon plate with mounting screws—Package of 2	.70
6216	Rod—Automatic brake trip rod with nut—Package of 5	.50
6221	Cover—Pickup cover	.75
6222	Pickup—Pickup unit complete	12.50
6224	Receptacle—Tungstone needle box holder	.75
6232	Box—Needle box with lid—Package of 2	.90
6237	Holder—Twin needle holder with mounting screws	.75
6238	Transformer—Input transformer	3.10
7084	Cover—Turntable cover	.50
7151	Back—Pickup housing back	.50
7305	Gear—Gear reducing unit complete	4.50
7332	Cable—Main cable from receiver to input transformer, volume control and radio record switch	2.30
7387	Reactor—Tone compensating reactor with bracket	.85
7388	Spindle—Turntable spindle with fibre gear—110 volts or 220 volts—60 cycles	6.00
7389	Rotor and shaft—110 volts or 220 volts—60 cycles	9.00
7390	Motor mounting washer and springs—Comprising 3 "C" washers, 9 cup washers and 6 springs—Package of 1 set	.75
7391	Volume control—Record volume control complete with mounting nut and washer	1.35
7393	Block—Pickup connector block and wire	.90
7400	Spindle—Turntable spindle with fibre gear—25 cycles	8.00
7401	Rotor and shaft—25 cycles	10.00
7402	Spindle—Turntable spindle with fibre gear—30 cycles	8.00
7403	Rotor and shaft—30 cycles	10.00
7443	Rotor and shaft—110 volts or 220 volts—50 cycles	9.00
7444	Spindle—Turntable spindle with fibre gear—110 volts or 220 volts—50 cycles	6.00
8795	Motor—Motor complete—110 volts—60 cycles	19.85
8800	Motor—Motor complete—110 volts—25 cycles	24.65
8801	Motor—Motor complete—110 volts—30 cycles	24.65
8856	Motor—Motor complete—110 volts—50 cycles	19.85
8872	Lever—Shift lever complete with mounting screws	1.60
8873	Brake—Automatic brake complete with mounting screws and washers	3.50
8876	Support—Lid support	2.00
8877	Turntable—Turntable with cover	4.60
8880	Arm—Pickup arm complete less pickup unit	6.00
8887	Motor—Motor complete—220 volts—60 cycles	19.85
8888	Motor—Motor complete—220 volts—50 cycles	19.85
10174	Springs—Automatic brake springs—Set of 4 springs—Package of 2 sets	.50
10184	Plate—Automatic brake trip plate complete with screws—Package of 5	.60
	CABINET ASSEMBLY	
X-14	Board—Baffle board and grille cloth	1.30
X-16	Stretcher	4.70
X-17	Foot	1.00
X-18	Leg	3.55
X-19	Lid	12.00
X-21	Overlay—Front top rail end overlay—R. H. or L. H.	1.25
X-22	Overlay—Front top rail center overlay	2.65
X-23	Mouldings—Control panel mouldings—Package of 1 set	1.60
X-85	Escutcheon—Tuning dial escutcheon	1.15
X-86	Panel—Control panel	6.90
X-87	Doors—R. H. and L. H. doors complete less door pulls and hinges—Package of 1 set	8.00
X-88	Mouldings—Door mouldings for R. H. and L. H. doors—Package of 1 set	3.00
2776	Catch—Door catch and strike with nail—Package of 2 sets	.50
3156	Label—Metal trade mark label—Package of 5	2.50
6210	Hinge assembly—Door hinge assembly—Comprising 4 hinges and 16 mounting screws—Package of 1 set.	.90
6211	Pull—Door pull with mounting screw—Package of 4.	1.20
6219	Hinge—Cabinet lid hinge complete with mounting screws—Package of 2	.50
6236	Support—Metal screen support	.50
9410	Cabinet—Cabinet complete less equipment	83.00
10901	Spring—Lid support spring—Package of 2	.50

SERVICE DIVISION

RCA Victor Company, Inc.

Camden, N. J., U. S. A.

S. O. 8911 5M—2-12'-32

SERVICE NOTES
for
RCA Victor RE-19

ELECTRICAL SPECIFICATIONS

Voltage Rating.....105–125 Volts
Frequency Rating.....25, 30, 50 or 60 Cycles
Power Consumption.....25 ~ 135 Watts, 30 ~ 140 Watts, 50 ~ 135 Watts, 60 ~ 130 Watts
Type of Circuit.....Automatic volume control Super-Heterodyne using Super-Control Radiotrons and single Pentode output stage
Type and Number of Radiotrons....1 UY-224, 2 RCA-235, 3 UY-227, 1 RCA-247, 1 UX-280 —Total 8
Number of R. F. Stages.....1
Type of First Detector..Tuned Input Grid Bias
Number of Intermediate Stages.....1
Type of Second Detector.....Power Grid Bias
Type of Tone Control....Variable resistance in series with condenser across secondary of interstage audio transformer
Number of Audio Stages (Radio).....1
Number of Audio Stages (Phonograph).....2
Type of Magnetic Pick-Up.....Low Impedance
Type of Tone Arm.....Inertia
Diameter of Turntable.....12 inches
Type of Rectifier.....Full Wave, UX-280
Type of Loudspeaker.....Electro-Dynamic
Undistorted Output.....2.5 Watts

PHYSICAL SPECIFICATIONS

Height.....42 inches
Depth.....15¼ inches
Width.....24¼ inches
Weight Alone.....92 lbs.
Weight Packed for Shipment.....140 lbs.

RCA Victor RE-19 is an eight tube Super-Heterodyne combination radio receiver and electric phonograph. The chassis used is similar to the R-12 with the exception that terminals for attaching a magnetic pickup are provided. The motor board assembly is similar to the RE-18. Reference to previous RCA Victor Service Notes should be made for service information relative to these assemblies. The replacement parts are given below and the diagrams on the following pages.

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
	RECEIVER ASSEMBLY	
2563	Resistor—6,000 ohms—Carbon type—1 watt—Package of 5	$3.00
2734	Capacitor—745 mmfd.—Package of 5	2.20
2746	Socket—Dial lamp socket	.50
2747	Cap—Grid contactor cap—Package of 5	.50
2749	Capacitor—2400 mmfd.	1.50
2875	Knob—Tuning control, volume control or tone control knob—Package of 5	1.50
2882	Socket—Five contact Radiotron socket—Complete with insulator—7 used	.50
2963	Resistor—8,000 ohms—Carbon type—1 watt—Package of 5	2.50
2968	Socket—Four contact Radiotron socket complete with insulator	.50
2970	Resistor—500,000 ohms—Carbon type—1 watt—Package of 5	2.50
3003	Cushion—Receiver sponge rubber cushion—Package of 4	.50
3024	Capacitor—9 mmfd.—Package of 2	.50
3045	Resistor—40,000 ohms—Carbon type—1 watt—Package of 5	2.50
3048	Resistor—500,000 ohms—Carbon type—½ watt—Package of 5	2.50
3049	Resistor—150 ohms—Carbon type—½ watt—Package of 5	2.50
3056	Shield—Radiotron shield—4 used—Package of 2	.50
3076	Resistor—1 megohm—Carbon type—½ watt—Package of 5	2.50
3077	Resistor—30,000 ohms—Carbon type—½ watt—Package of 5	2.50
3078	Resistor—10,000 ohms—Carbon type—½ watt—Package of 5	2.50
3079	Resistor—40,000 ohms—Carbon type—½ watt—Package of 5	2.50
3081	Resistor—16,000 ohms—Carbon type—3 watts	.60
3092	Volume control—Volume control complete with mounting nut	1.50
3095	Coil—R.F. coil complete with mounting bracket	1.90
3234	Tone control—Tone control complete with mounting nut	1.90
3235	Coil—First detector and oscillator coil	2.85
3251	Coil—R.F. choke coil	$0.90
6179	Terminal—Single ground terminal—Complete with mounting rivet—Package of 5	.50
6185	Resistor—100,000 ohms—Carbon type—½ watt—Package of 5	2.00
6186	Resistor—500,000 ohms—Carbon type—½ watt—Package of 5	2.00
6187	Resistor—300,000 ohms—Carbon type—½ watt—Package of 5	2.00
6188	Resistor—2 megohm—Carbon type—½ watt—Package of 5	2.00
6189	Bracket—Dial lamp bracket and indicator—Package of 2	.65
6191	Cord—Tuning condenser drive cord—Package of 5	.55
6192	Spring—Dial drum drive cord tension spring—Package of 10	.50
6214	Board—Magnetic pickup terminal board—Package of 2	.70
7054	Cord—Power cord	1.00
7062	Capacitor—Adjustable capacitor—15–70 mmfd.	1.00
7298	Capacitor—0.01 mfd.	.80
7340	Transformer—First intermediate transformer	3.00
7341	Transformer—Second intermediate transformer	3.00
7342	Capacitor—Comprising two 0.05 mfd., four 0.5 mfd., one 10.0 mfd., two 4.0 mfd., and four 0.1 mfd. capacitors in metal container	7.85
7343	Transformer—Audio transformer	3.85
7344	Transformer—Power transformer—105–125 volts, 50–60 cycles	8.00
7348	Board—Resistor board complete less resistors and capacitors	2.30
7362	Capacitor—0.025 mfd.	1.00
7438	Capacitor—Variable tuning capacitor	5.20
7439	Drum—Dial drive drum with set screws complete with 3 dial scale mounting nuts	.50
7440	Scale—Dial and dial scale	.75
8770	Transformer—Power transformer—105–125 volts, 25–40 cycles	12.00
8771	Transformer—Power transformer—220 volts, 60 cycles	9.00
8837	Support—Receiver metal mounting support—Package of 4	.70

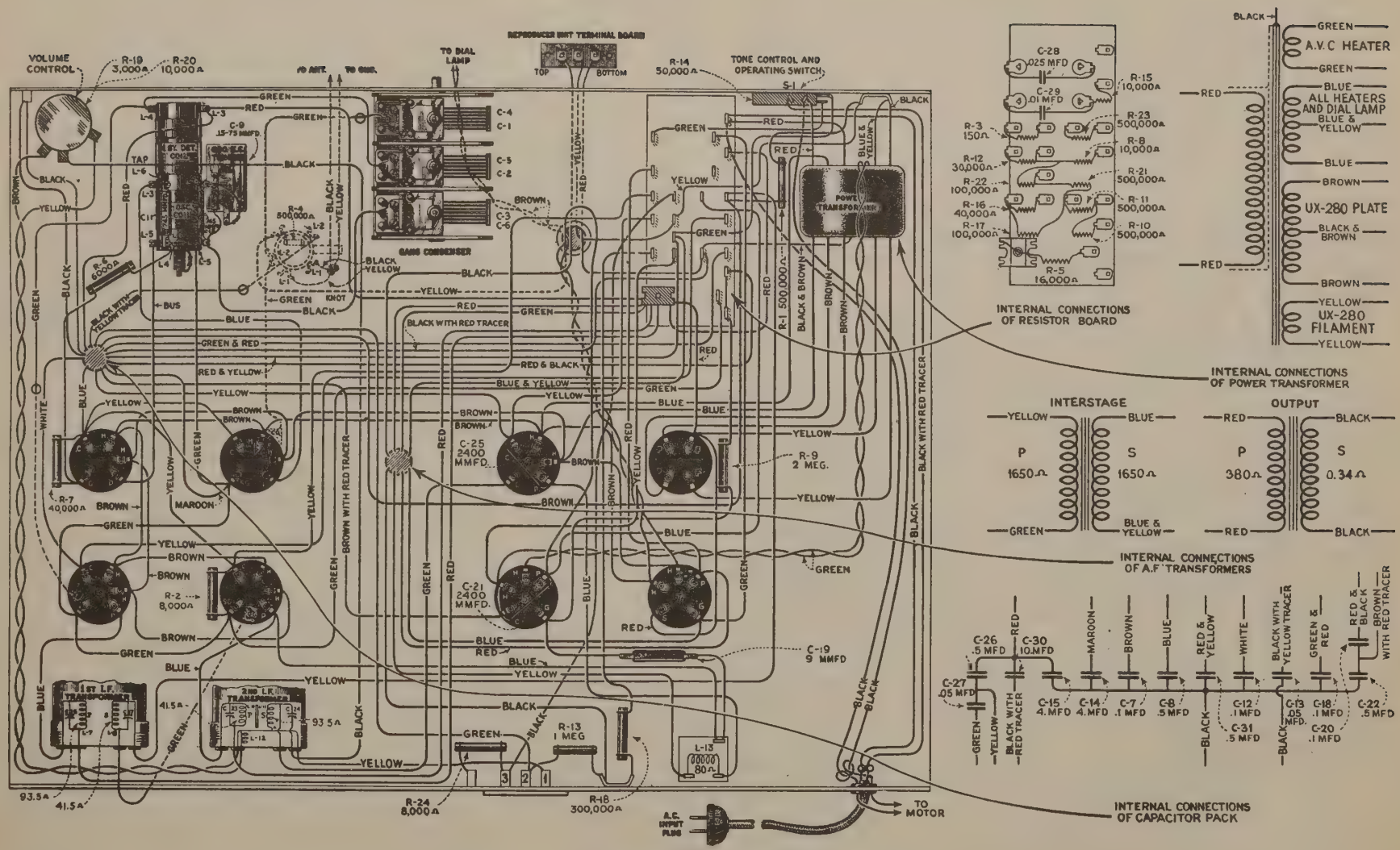


Figure 1—Wiring Diagram

REPLACEMENT PARTS—Continued

Stock No.	DESCRIPTION	List Price
	LOUDSPEAKER ASSEMBLY	
3005	Screw assembly—Speaker mounting screw assembly—Comprising 4 screws, 4 eyelets, 8 washers and 8 nuts—Package of 1 set	$0.50
7345	Coil assembly—Speaker field coil assembly—Comprising field coil, magnet and cone bracket	5.00
8601	Cone—Speaker paper cone—Package of 5	15.00
8559	Ring—Speaker cone retaining ring	.80
	MOTOR BOARD ASSEMBLY	
X68	Board—Motor board	4.00
2614	Switch—Automatic brake switch	1.40
2620	Cushions—Pickup rubber cushions—Comprising one damper and two pivot cushions—Package of 5 sets	1.25
2767	Spring—Pickup magnet retaining spring—Package of 10	.50
2768	Armature—Pickup armature	.50
2770	Plate—Pickup damper plate—Package of 5	.50
2771	Screw—Pickup damper plate mounting screw—Package of 10	.50
2875	Knob—Record switch knob—Package of 5	1.50
2908	Spring—Gear reducing pawl spring—Package of 10	.50
3052	Screw assembly—Pickup pole shoe mounting screw assembly—Comprising nut, washer and screw—Package of 10 sets	.50
3157	Gear—Driving gear with set screw—Located on turntable spindle above top plate	1.00
3159	Friction brake—Gear reducing brake spring and pad—Complete with mounting rivets—Package of 4	2.00
3161	Spring—Shift lever spring—Package of 5	1.20
3167	Magnet—Pickup magnet	2.60
3168	Coil—Pickup coil	.85
3169	Pole shoe—Pickup pole shoe—R.H.	1.45
3170	Pole shoe—Pickup pole shoe—L.H.	1.45
3175	Receptacle—Tungstone needle box receptacle	.75
3189	Box—Needle box with lid—Package of 2	.70
3205	Screw—Pickup needle holding screw—Package of 10	.80
3207	Screw—Pickup cover mounting screw—Package of 10	.50
3208	Screw assembly—Pickup mounting screw assembly Comprising one screw, one nut, and one washer—Package of 10	.60
3211	Washer—Turntable spindle leather washer—Package of 10	.50
3224	Switch—Record switch complete with mounting washer and nut	1.35
3278	Bearing—Rotor shaft fibre thrust bearing and cork button—Package of 10	.50
3279	Screw and nut—Rotor shaft thrust bearing adjusting screw and lock nut—Package of 10	.50
3280	Washer—Metal washer—Located on turntable spindle underneath gear reducing unit—Package of 20	.50
3281	Pawl—Gear reducing pawl complete with mounting stud	.50
6119	Stud—Motor hanging stud—Package of 6	.50
6120	Screw—For holding turntable spindle bearing and grease cap—Package of 10	.50
6121	Bearing—Turntable spindle bearing and grease cap	1.10
6215	Escutcheon—Shift lever speed escutcheon plate—Complete with mounting screws—Package of 2	.70
6216	Rod—Automatic brake trip rod with lock nut—Package of 5	$0.50
6217	Pickup—Pickup unit complete	12.50
6218	Screw and washer—Motor board mounting screw and washer—Package of 10	.50
6221	Cover—Pickup cover	.75
7084	Cover—Turntable cover	.50
7151	Back—Pickup housing back	.50
7305	Gear reducing unit complete	4.50
7387	Reactor—Compensating reactor with mounting bracket	.85
7388	Spindle—Turntable spindle with fibre gear—110 or 220 volts—60 cycles	6.00
7389	Rotor and shaft—110 or 220 volts—60 cycles	9.00
7390	Spring and washer—Motor mounting springs and washers—Comprising 9 cup washers, 3 "C" washers and 6 springs—Package of 1 set	.75
7393	Block—Pickup connector block and wire	.90
7400	Spindle—Turntable spindle with fibre gear—25 cycles	8.00
7401	Rotor and shaft—25 cycles	10.00
7402	Spindle—Turntable spindle with fibre gear—30 cycles	8.00
7403	Rotor and shaft—30 cycles	10.00
7443	Rotor and shaft—110 or 220 volts—50 cycles	9.00
7444	Spindle—Turntable spindle with fibre gear—110 or 220 volts—50 cycles	6.00
7445	Transformer—Input transformer	4.55
8795	Motor—Motor complete, 110 volts, 60 cycles	19.85
8800	Motor—Motor complete—25 cycles	24.65
8801	Motor—Motor complete—30 cycles	24.65
8856	Motor—Motor complete—110 volts—50 cycles	19.85
8872	Shift lever—Speed shift lever complete with mounting screws	1.60
8873	Brake—Automatic brake complete with mounting screws and washers	3.50
8874	Arm—Pickup arm complete less pickup unit	6.00
8875	Cable—Main cable from input transformer to volume control, record switch and receiver	2.20
8876	Support—Lid support	2.00
8877	Turntable—Turntable with cover	4.60
8887	Motor—Motor complete—220 volts—60 cycles	19.85
8888	Motor—Motor complete—220 volts—50 cycles	19.85
10174	Spring—Automatic brake springs—Set of 4 springs—Package of 2 sets	.50
10184	Plate—Automatic brake latch trip plate complete with mounting screws—Package of 5	.60
	CABINET ASSEMBLY	
X69	Panel—Control panel	6.20
X70	Lid	6.90
X71	Leg	2.00
X72	Foot	.90
X73	Stretcher	4.90
X74	Baffle board and grille cloth	.95
3156	Label—Metal trade mark label—Package of 5	2.50
6219	Hinge—Cabinet lid hinge—Complete with mounting screws—Package of 2	.50
7441	Escutcheon—Tuning dial escutcheon—Complete with mounting screws	1.05
9408	Cabinet—Cabinet complete less equipment	67.00

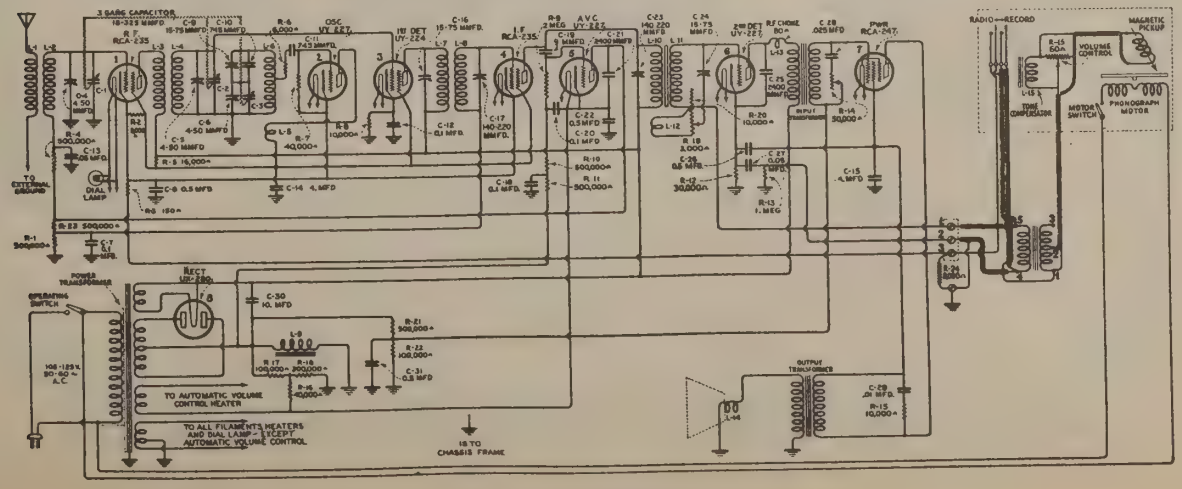


Figure 2—Schematic Circuit

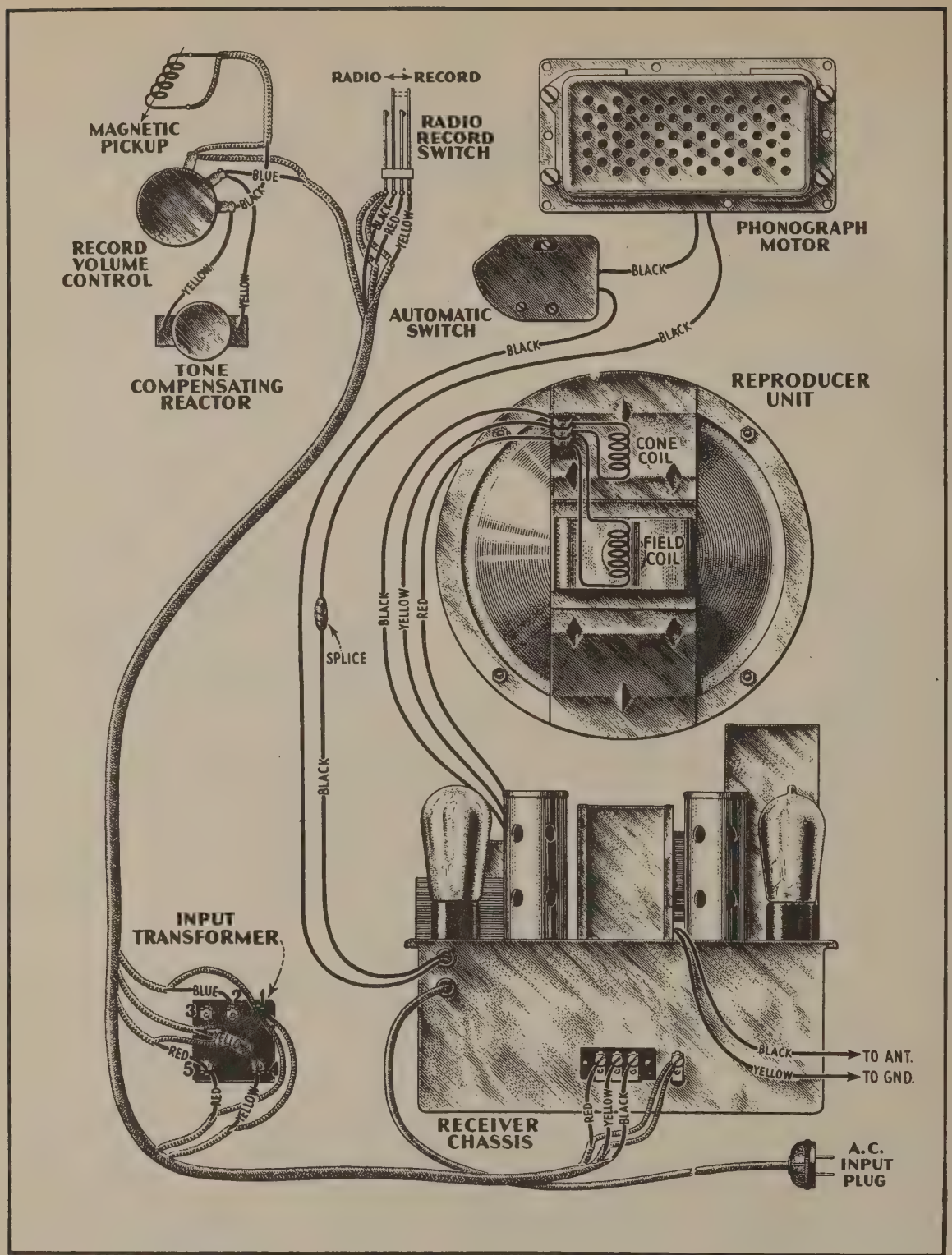


Figure 3—Assembly Wiring

Service Division

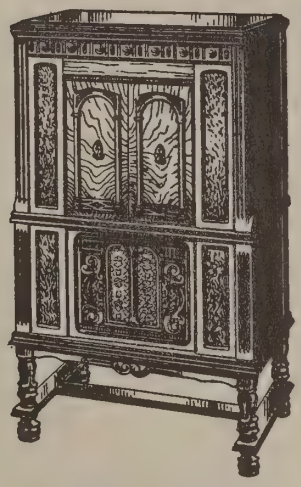
RCA Victor Company, Inc.

Camden, N. J., U. S. A.

S. O. 8734 10M—1-14-'32

RCA Victor
Radiola Electrola RE-20

SERVICE NOTES



RCA Victor RE-20

SERVICE DIVISION

RCA Victor Company, Inc.

Camden, N.J.

A RADIO CORPORATION OF AMERICA SUBSIDIARY

REPRESENTATIVES IN PRINCIPAL CITIES

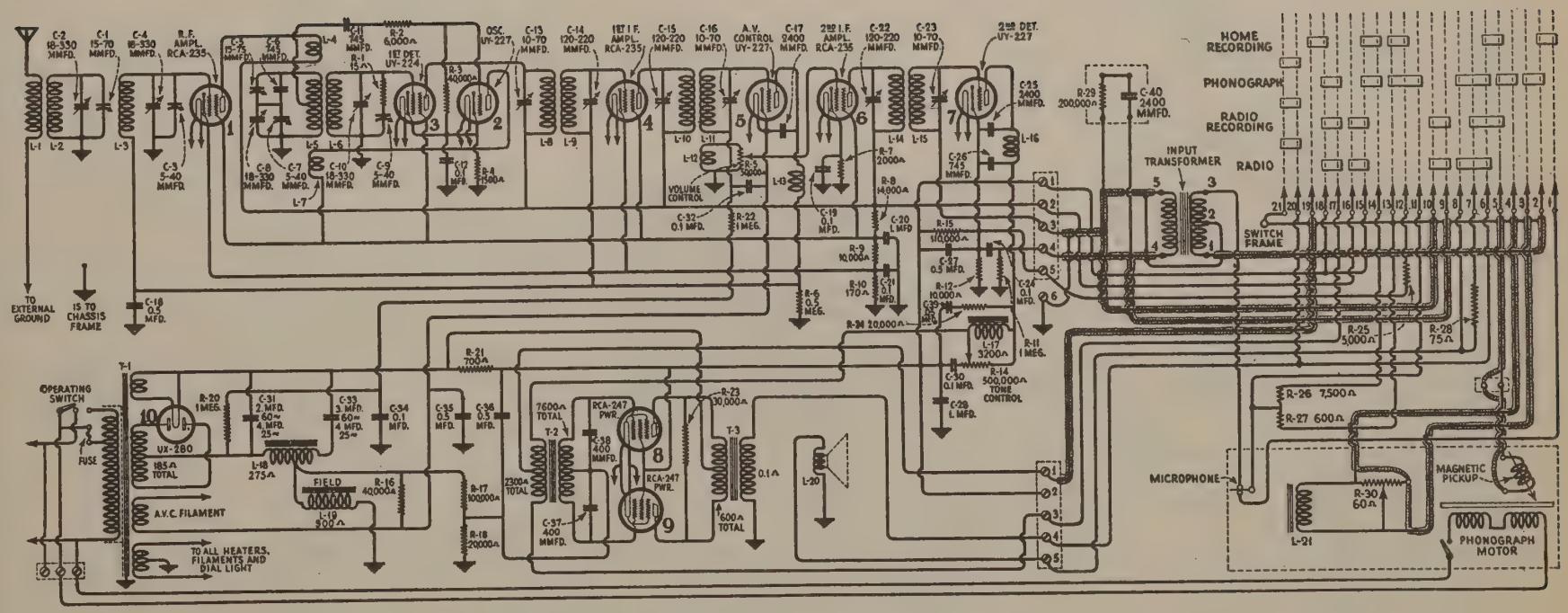


Figure 1—Schematic Circuit

SERVICE NOTES

for

RCA Victor Radiola Electrola RE-20

ELECTRICAL SPECIFICATIONS

Voltage Rating	105–125 Volts
Frequency Rating	25, 30, 50 and 60 Cycles
Power Consumption (Radio only)	145 Watts
Power Consumption (Phonograph)	160 Watts (Approximately)
Type of Circuit	A. V. C. Super-Heterodyne with Push-pull Pentode Output Stage
Type and Number of Radiotrons	3 RCA-235, 1 UY-224, 3 UY-227, 2 RCA-247, 1 UX-280—Total 10
Number of R. F. Stages	One—Two Tuned Circuits Ahead of First Tube
Type of First Detector	Tuned Input Grid Bias
Number of Intermediate Stages	Two
Type of Tone Control	Variable resistor, capacitor and reactor in plate circuit of second detector
Number of Audio Stages (Radio)	1 (Push-Pull Pentode)
Number of Audio Stages (Phonograph)	2 (one UY-227 and one Push-pull Pentode)
Type of Magnetic Pickup	Low Impedance
Type of Tone Arm	Inertia
Diameter of Turntable	12 inches
Type of Phonograph Motor	Induction, running at synchronous speed
Turntable Speed	78 and 33⅓ R. P. M.
Type of Rectifier	Full Wave, UX-280
Type of Loudspeaker	Electro-Dynamic
Wattage Dissipation in Loudspeaker Field	10 Watts
Undistorted Output	4.0 Watts

PHYSICAL SPECIFICATIONS

Height	43 inches
Depth	16 $\frac{9}{32}$ inches
Width	26⅜ inches
Weight Alone	152 Pounds
Weight Packed for Shipment	209 Pounds

RCA Victor RE-20 is a ten tube De Luxe Super-Heterodyne combination radio receiver and electric phonograph. Except for the differences in cabinet and omission of the automatic record changing mechanism, the RE-20 is similar to the RAE-59.

Service work in conjunction with this model is similar to that of the R-50, R-55 and RAE-59. Reference to these Service Notes should therefore be made when such information is necessary. The replacement parts and the diagrams are given on the following pages.

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
	RECEIVER ASSEMBLY	
2563	Resistor—6,000 ohms—Carbon type—1 watt—Package of 5	$3.00
2726	Socket—Five contact Radiotron socket—Complete with insulator—7 used	.70
2731	Resistor—10,000 ohms—Carbon type—1 watt—Package of 5	2.00
2732	Resistor—110,000 ohms—Carbon type—1 watt—Package of 5	2.00
2736	Resistor—170 ohms—Carbon type—1 watt—Package of 5	2.00
2740	Cord—Tuning condenser drive cord—Package of 5	1.00
2741	Idler—Tuning condenser drive cord idler—Package of 5	.80
2746	Socket—Dial lamp socket	.50
2747	Cap—Grid contactor cap—Package of 5	.50
2749	Capacitor—2400 mmfd.	1.50
2970	Resistor—500,000 ohms—Carbon type—1 watt—Package of 5	2.50
3031	Board—Terminal board complete with insulator—Three terminals	.50
3033	Resistor—1 megohm—Carbon type—½ watt—Package of 5	2.00
3045	Resistor—40,000 ohms—Carbon type—1 watt—Package of 5	2.50
3050	Resistor—14,000 ohms—Carbon type—3 watt	.60
3137	Knob—Station selector, Volume control or tone control knob—Package of 5	3.25
3138	Board—Terminal board complete with soldering terminal	.50
3139	Coil—1st detector and oscillator coil complete with shield	3.95
3142	Volume Control—Volume control complete with mounting nut	1.65
3143	Tone control—Tone control complete with mounting nut	1.50
3144	Inductor—Tone control inductor	1.65
3153	Resistor—1500 ohms—Carbon type—1 watt—Package of 5	2.75
3154	Resistor—2,000 ohms—Carbon type—1 watt—Package of 5	2.75
3220	Resistor—15 ohms—Flexible wire type—Package of 5	2.75
3240	Nut—Shield cover mounting nut—Package of 13	.50
6034	Cushion—Receiver chassis sponge rubber cushion—Package of 4	1.20
6114	Resistor—20,000 ohms—Carbon type—1 watt—Package of 5	2.00
6220	Capacitor—0.05 mfd.—Package of 5	1.10
7062	Capacitor—Adjustable capacitor—15–70 mmfd.—2 used	1.00
7063	Capacitor—Adjustable capacitor 5–40 mmfd.—3 used	1.00
7278	Coil—R. F. and link circuit coil	2.50
7280	Board—Terminal board complete with six terminals	.90
7281	Transformer—1st intermediate transformer	3.25
7282	Transformer—2nd intermediate transformer	3.50
7283	Transformer—3rd intermediate transformer	3.25
7284	Board—Resistor board complete with insulator—Less resistors, capacitors and coils	2.70
7285	Capacitor pack—Comprising one 1.0 mfd., one 0.5 mfd., and two 0.1 mfd. capacitors in metal container—6 leads	3.50
7286	Capacitor pack—Comprising one 1.0 mfd., one 0.5 mfd., and three 0.1 mfd. capacitors in metal container—10 leads	4.50
7287	Bracket—Dial lamp bracket and indicator	.50
7288	Scale—Dial scale—Package of 5	2.50
7297	Coil—R.F. choke coil for 2nd detector or automatic volume control	.75
7298	Capacitor—0.01 mfd.	.80
7299	Capacitor—745 mfd.	.70
7331	Cable—Shielded receiver cable	2.30
7367	Drum—Dial scale drum	1.10
7368	Shaft assembly—Drive shaft assembly—Comprising bracket, drive shaft, idler shaft and two drive cord bushings	$0.90
8708	Capacitor—Tuning capacitor assembly—Comprising four variable capacitors, drive, drive cord, spring and dial drum—Assembled	12.25
8791	Cover—Receiver chassis shield removable cover	1.50
8794	Shield—Receiver chassis shield complete	7.25
	S. P. U. REPRODUCER ASSEMBLY	
2240	Resistor—30,000 ohms—Carbon type—1 watt	.70
2546	Fuse—Glass type—1.5 amperes—Package of 5	.50
2882	Socket—Five contact Radiotron socket complete with insulator	.50
3045	Resistor—40,000 ohms—Carbon type—1 watt—Package of 5	2.50
3058	Resistor—100,000 ohms—Carbon type—1 watt—Package of 5	2.50
3085	Capacitor—400 mmfd.	.60
3099	Capacitor—0.005 mfd.	.75
3145	Resistor—700 ohms—Carbon type—3 watt	.85
3146	Board—Terminal board complete with insulator—Less capacitor No. 3099	1.25
3147	Cover—Fuse cover with insulator	.95
3149	Switch—Toggle type—Operating switch complete with mounting nuts and escutcheon plate	1.25
6114	Resistor—20,000 ohms—Carbon type—1 watt—Package of 5	2.00
7290	Reactor—Filter reactor	4.75
7291	Board—Terminal board and four contact radiotron socket complete with all terminals and fuse clips	.50
7293	Strip—Terminal strip—Complete with 8 terminals	1.15
7294	Cover—Terminal strip cover for 7293	.60
7295	Strip—Terminal strip—Complete with 5 terminals	.85
7370	Cover—Terminal strip cover for 7295	.55
8710	Transformer—Power transformer—105–125 volts, 50–60 cycles	12.50
8711	Transformer—Audio transformer	6.60
8712	Capacitor pack—Comprising one 2.0 mfd., one 3.0 mfd., one 0.1 mfd., and two 0.5 mfd. capacitors in metal container—50–60 cycles	7.80
8749	Transformer—Power transformer—105–125 volts, 25–40 cycles	20.50
8750	Transformer—Power transformer—220 volts, 50–60 cycles	13.00
8751	Capacitor pack—Comprising two 4.0 mfd., two 0.5 mfd. and one 0.1 mfd. capacitors in metal container	9.50
10907	Fuse—Glass type—3 amperes—Package of 5	.50
	LOUDSPEAKER ASSEMBLY	
7292	Screw assembly—Speaker mounting screw assembly—Comprising two screws, two nuts, two washers and one plate—Package of 1 set	.95
8558	Cone—Speaker paper cone	4.00
8559	Ring—Cone retaining ring	.80
8713	Coil—Speaker field coil	5.00
	MOTOR BOARD AND MISCELLANEOUS ASSEMBLIES	
X-75	Board—Motor board	5.15
X-76	Block—Microphone wood block	1.35
2614	Switch—Automatic brake switch	1.40
2620	Cushion—Pickup rubber cushions—Comprising 1 damper and two pivot cushions—Package of 5 sets	1.25
2749	Capacitor—2400 mmfd.	1.50
2767	Spring—Pickup magnet retaining spring—Package of 10	.50
2768	Armature—Pickup armature	.50
2770	Plate—Pickup damper plate—Package of 5	.50
2771	Screw—Pickup damper plate mounting screw—Package of 10	.50

REPLACEMENT PARTS—(Continued)

Stock No.	DESCRIPTION	List Price
2779	Pointer—Selector switch pointer—Package of 10	$0.50
3052	Screw assembly—Pickup pole shoe mounting screw assembly comprising screw, nut and washer—Package of 10 sets	.50
3137	Knob—Selector switch knob—Package of 5	3.25
3157	Gear—Driving gear—Located on turntable spindle above top plate	1.00
3159	Friction brake—Gear reducing friction brake spring with felt pad—Complete with mounting rivet—Package of 4	2.00
3161	Spring—Shift lever spring—Package of 5	1.20
3167	Magnet—Pickup magnet	2.60
3169	Pole shoe—Pickup pole shoe—R.H.	1.45
3170	Pole shoe—Pickup pole shoe—L.H.	1.45
3183	Socket—Microphone socket—Package of 5	2.00
3184	Board—Pickup terminal board complete with two terminals	.50
3205	Screw—Pickup needle holding screw—Package of 10	.80
3207	Screw—Pickup cover mounting screw—Package of 10	.50
3208	Screw assembly—Pickup mounting screw assembly—Comprising screw, nut and washer—Package of 10	.60
3211	Washer—Turntable spindle leather washer—Package of 10	.50
3215	Plug—Microphone cord plug	.50
3216	Cushions—Microphone unit suspension rubbers—Package of 6	.50
3261	Cap—Rubber record drive cap—Package of 5	.50
3278	Bearing—Rotor shaft fibre thrust bearing and cork button—Package of 10	.50
3279	Screw and nut—Rotor shaft thrust bearing adjusting screw and lock nut—Package of 10	.50
3280	Washer—Metal washer—Located on turntable spindle underneath gear reducing unit—Package of 20	.50
3281	Pawl—Gear reducing pawl with mounting stud	.50
6119	Motor hanging stud—Package of 6	0.50
6120	Screw—For holding turntable spindle bearing and grease cap—Package of 10	.50
6121	Bearing—Turntable spindle bearing and grease cap	1.10
6216	Rod—Automatic brake trip rod with nut—Package of 5	.50
6218	Screw and washer—Motor board mounting screw and washer—Package of 10	.50
6221	Cover—Pickup cover	.75
6222	Pickup—Pickup unit complete	12.50
6223	Cable—Power cable from motor and motor switch to S. P. U. terminal board	.65
6224	Receptacle—Tungstone needle box receptacle	.75
6225	Volume control—Record volume control—Complete with mounting nut and washer	1.35
6226	Transformer—Phono input transformer	3.75
6227	Resistor board assembly—Comprising one 200,000 ohms—Carbon type—¼ watt resistor and one 2400 mmfd. tooth pick capacitor on board	1.35
6228	Resistor—200,000 ohms—Carbon type—½ watt—Package of 5	2.50
6229	Cable—30" shielded red cable from selector switch to volume control—Package of 2	.70
6230	Cable—30" shielded green cable from selector switch to volume control—Package of 2	.70
6231	Cable—18" shielded black cable from selector switch to pickup terminal board—Package of 2	.60
6232	Box—Needle box with lid—Package of 2	.90
6233	Weight—Recording weight	1.40
6234	Escutcheon—Speed escutcheon plate with mounting screws—Package of 2	.70
6235	Escutcheon—Selector switch escutcheon—Package of 5	3.50
7084	Cover—Turntable cover	.50
7151	Back—Pickup housing back	.50
7305	Gear reducing unit complete	4.50
7327	Mechanism—Microphone mechanism complete with cord	14.95
7375	Resistor—13175 ohms tapped porcelain resistor	2.10
7387	Reactor—Tone compensating reactor complete with mounting bracket	.85
7388	Spindle—Turntable spindle with fibre gear—110 volts or 220 volts—60 cycles	6.00
7389	Rotor and shaft—110 volts or 220 volts—60 cycles	9.00
7390	Motor mounting washers and springs—Comprising 9 cup washers, 3 "C" washers and 6 springs—Package of 1 set	.75
7393	Block—Pickup connector block and wire	.90
7400	Spindle—Turntable spindle with fibre gear—25 cycles	8.00
7401	Rotor and shaft—25 cycles	10.00
7443	Rotor and shaft—110 volts or 220 volts—50 cycles	9.00
7444	Spindle—Turntable spindle with fibre gear—110 volts or 220 volts—50 cycles	6.00
8795	Motor—Motor complete—110 volts—60 cycles	19.85
8800	Motor—Motor complete—110 volts—25 cycles	24.65
8856	Motor—Motor complete—110 volts—50 cycles	19.85
8872	Shift lever—Shift lever complete with mounting screws	1.60
8873	Brake—Automatic brake complete with mounting screws and washers	3.50
8877	Turntable—Turntable with cover	4.60
8880	Arm—Pickup arm complete less pickup unit	6.00
8881	Switch—Selector switch with mounting nut	6.40
8882	Cable—Main cable—From amplifier to input transformer, tapped resistor and selector switch	2.30
8883	Microphone—Microphone complete	21.50
8884	Frame—Microphone frame assembly—Less cover assemblies	1.50
8885	Cover—Microphone screen cover assembly	1.25
8886	Cord—Microphone 3 conductor cord	.80
8887	Motor—Motor complete—220 volts—60 cycles	19.85
8888	Motor—Motor complete—220 volts—50 cycles	19.85
10174	Spring—Automatic brake springs—Set of 4 springs—Package of 2 sets	.50
10184	Plate—Automatic brake latch trip plate with mounting screws—Package of 5	.60
	CABINET ASSEMBLY	
X-77	Panel—Control panel	4.70
X-78	Escutcheon—Tuning dial wood escutcheon	1.40
X-79	Baffle board and grille cloth	1.40
X-80	Stretcher	4.50
X-81	Foot	.75
X-82	Ornament—Leg ornament	1.20
X-83	Lid—Cabinet lid	13.00
X-84	Doors—R.H. and L.H. doors—Less cabinet door hinges and pulls—Package of 1 pair	10.90
2776	Catch—Door catch and strike with nail—Package of 2 sets	.50
3136	Screen—Dial screen—Package of 2	.50
3156	Label—Metal trade mark label—Package of 5	2.50
6211	Pull—Door pull with mounting screw—Package of 4	1.20
6219	Hinge—Cabinet lid hinge with mounting screws—Package of 2	.50
7279	Support—Dial screen metal support	.50
8876	Support—Lid support	2.00
9409	Cabinet—Cabinet complete less equipment	116.35
10254	Hinge assembly—Cabinet door hinge—Comprising 4 hinges and 16 mounting screws—Package of 1 set	1.70

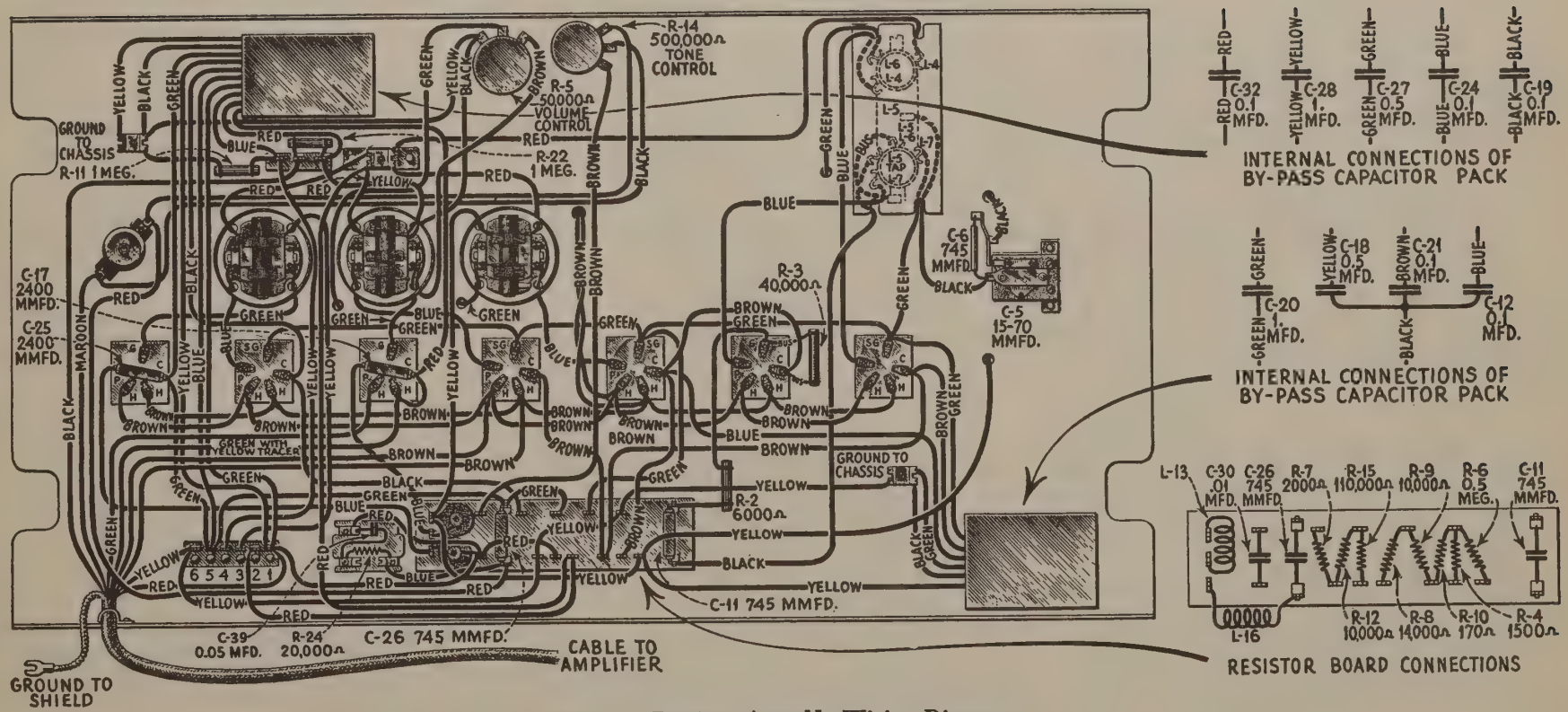


Figure 2—Receiver Assembly Wiring Diagram

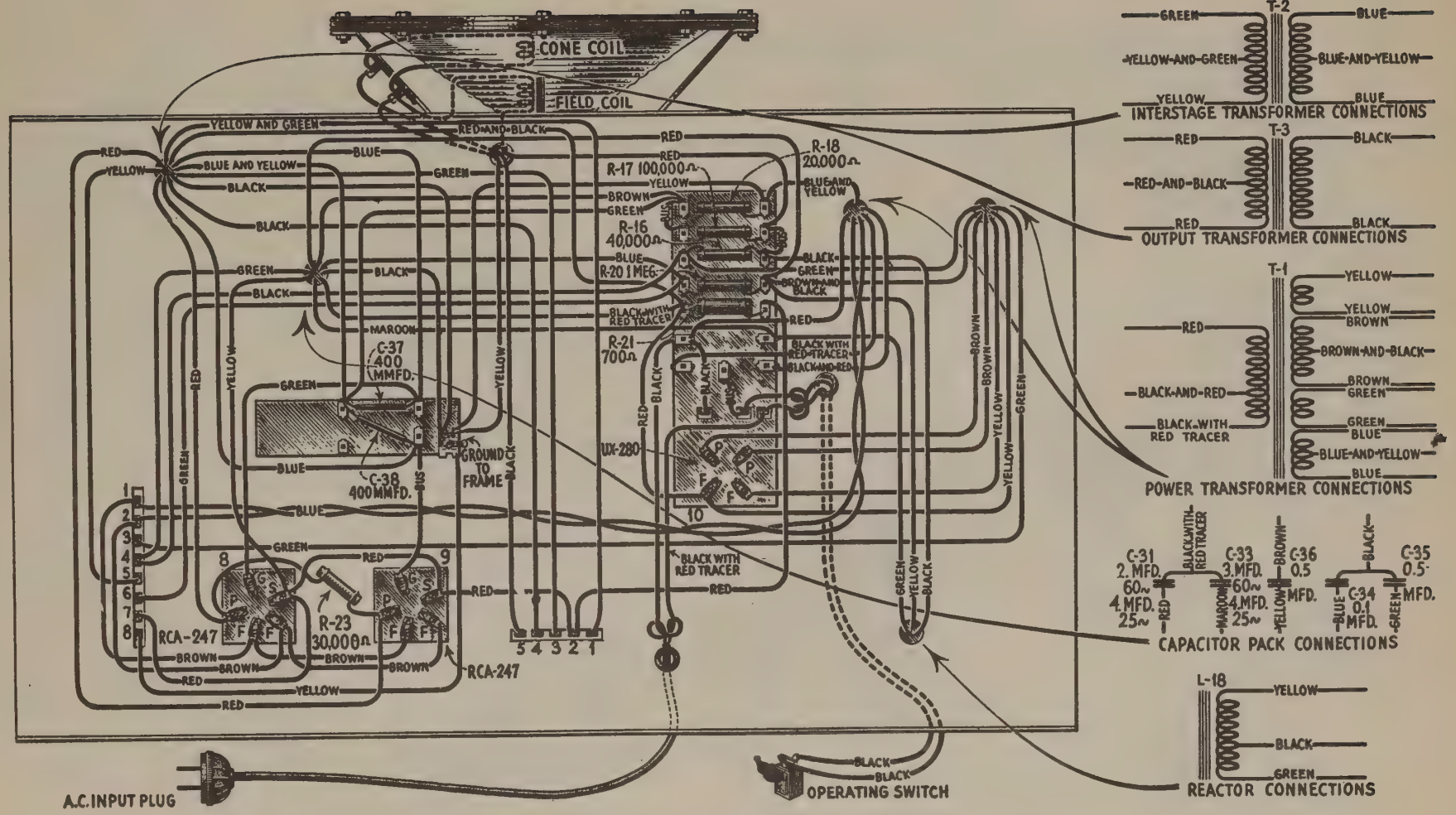


Figure 3—S. P. U. Reproducer Wiring Diagram

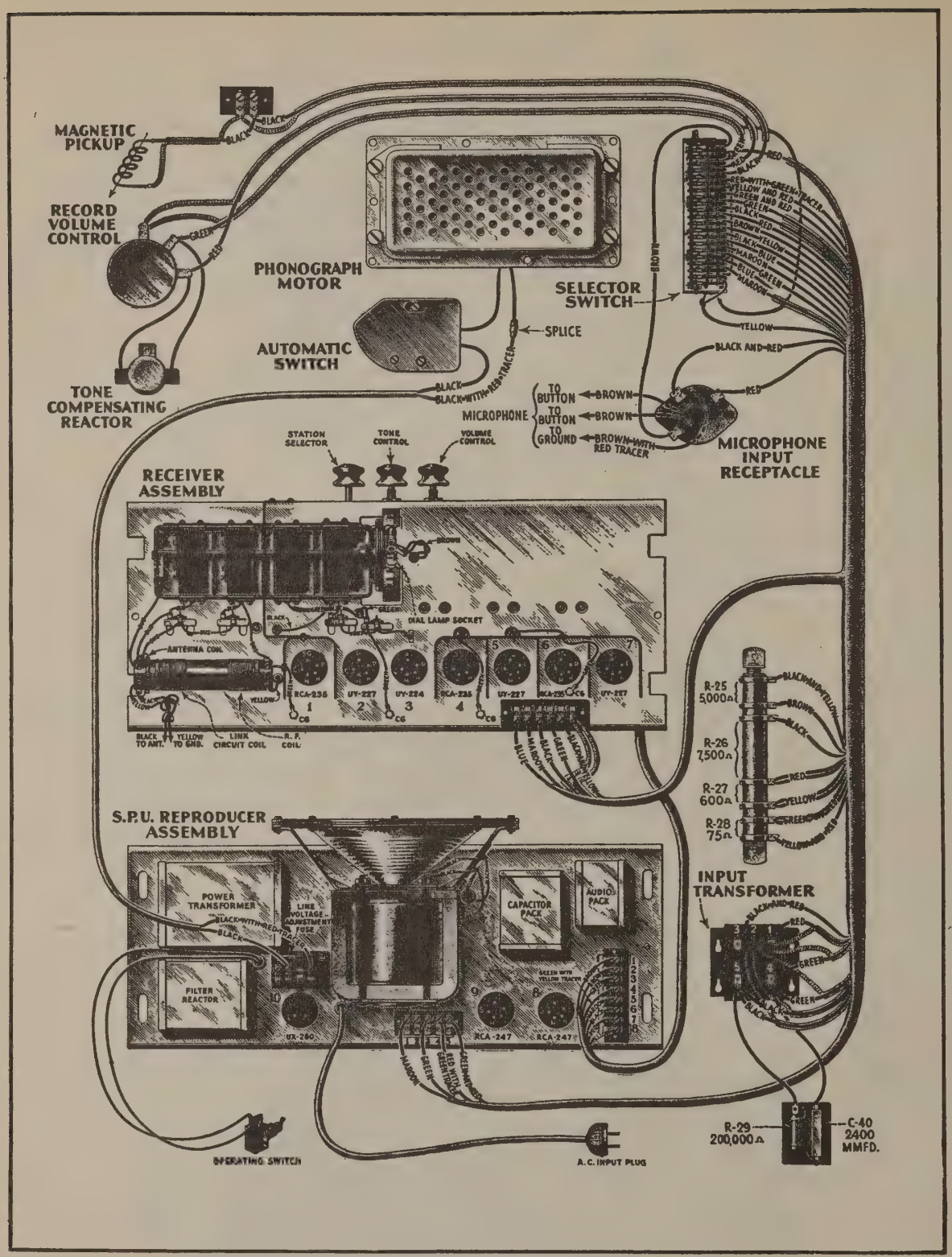


Figure 4—Assembly Wiring

Service Division

RCA Victor Company, Inc.

Camden, N. J., U. S. A.

S. O. 8725—10M—1-14-'38

SERVICE NOTES
for
RCA Victor R-21

ELECTRICAL SPECIFICATIONS

Voltage Rating.....105–125 Volts
Frequency Rating.....50–60 Cycles and 25–40 Cycles
Power Consumption...25–40 Cycles 140 Watts, 50–60 Cycles 135 Watts
Type of Circuit.....Super-Heterodyne using Super-Control Radiotrons and Push-pull Pentode output stage
Type and Number of Radiotrons...2 RCA-235, 3 UY-227, 1 UY-224, 1 UX-280, 2 RCA-247, —Total, 9
Number of Radio Frequency Stages.....1
Type of First Detector..Tuned Input Grid Bias
Number of Intermediate Stages.....1
Type of second detector.... ..Power Grid Bias
Type of Automatic Volume Control....UY-227 Controlled by signal voltage in turn controlling bias on R. F. and I. F. tubes
Type of Manual Volume Control Potentiometer used to regulate input to second detector
Type of Tone Control. ..Variable resistance in series with capacitor connected across grids of output stage. Capacitor tunes transformer at "low" position
Number of Audio Stages.....1
Type of Rectifier.... .....Full wave
Type of Loudspeaker.....8″ Electro-Dynamic
Undistorted Output.....4.0 Watts

PHYSICAL SPECIFICATIONS

Height.....41½ inches
Depth.....13⅝ inches
Width.....25½ inches
Weight Alone.....72 lbs.
Weight Packed for Shipment. .....116 lbs.

RCA Victor Model R-21 is a nine tube screen grid Super-Heterodyne radio receiver. Features such as Super-control Radiotrons, automatic volume control, push-pull Pentode output, large baffle area cabinet and the inherent sensitivity, selectivity and tone quality of the RCA Victor Super-Heterodyne are incorporated in this receiver.

The chassis and loudspeaker used in Model R-21 is identical with that used in the R-11 except for the dial and scale. A reference to the R-11 Service Notes will therefore give any information necessary in reference to circuit diagram, voltage reading and other service information. One change should be noted in later production of R-11s and all R-21s and that is the change in value of Resistor R-9 from 5 Megohms to 2 Megohms. The Replacement Parts are listed below.

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price	Stock No.	DESCRIPTION	List Price
	RECIEVER ASSEMBLY		3046	Resistor—190,000 ohms—Carbon type —½ Watt—Package of 5.....	$2.50
2563	Resistor—6,000 ohms—Carbon type— 1 Watt—Package of 5.....	$3.00	3047	Resistor—1,500 ohms—Carbon type— ½ Watt—Package of 5.....	2.50
2730	Resistor—18,000 ohms—Carbon type— 1 Watt—Package of 5.....	2.00	3048	Resistor—500,000 Ohms—Carbon type —½ Watt—Package of 5.....	2.50
2734	Capacitor—745 mmfd.—Package of 5..	2.20	3049	Resistor—150 Ohms—Carbon type—½ Watt—Package of 5.....	2.50
2746	Socket—Dial lamp socket.....	.50			
2747	Cap—Grid contactor cap—Package of 5.	.50	3050	Resistor—14,000 Ohms—Carbon type —3 Watt.....	.60
2749	Capacitor—2400 mmfd.....	1.50			
2882	Socket—5 contact Radiotron socket— Complete with insulator—8 used.....	.50	3053	Capacitor—9 mmfd.—Package of 2....	.50
2968	Socket—4 contact Radiotron socket— Complete with insulator—1 used.....	.50	3055	Cushion—Receiver chassis sponge rubber cushion—Package of 4.....	.50

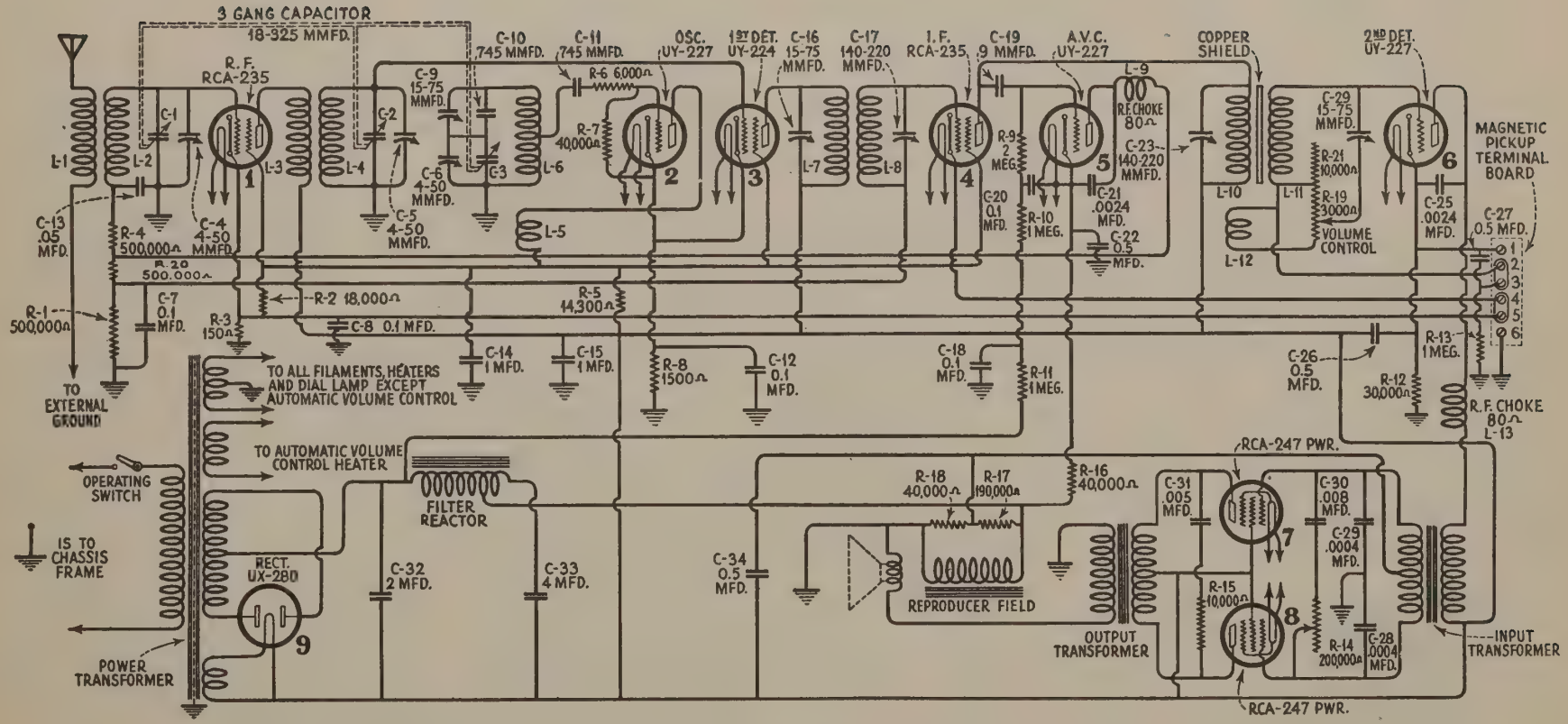


Figure 1—Schematic Circuit

REPLACEMENT PARTS (Continued)

Stock No.	DESCRIPTION	List Price
	RECEIVER ASSEMBLY (Continued)	
3056	Shield—Radiotron shield—6 used—Package of 2	$0.50
3076	Resistor—1 Megohm—Carbon type—½ Watt—Package of 5	2.50
3077	Resistor—30,000 Ohms—Carbon type—½ Watt—Package of 5	2.50
3078	Resistor—10,000 Ohms—Carbon type—½ Watt—Package of 5	2.50
3079	Resistor—40,000 Ohms—Carbon type—½ Watt—Package of 5	2.50
3085	Capacitor—400 mmfd	.60
3089	Board — Magnetic pickup terminal board — Complete with mounting rivets	.50
3090	Board—A.V.C. and 2nd detector R.F. choke board—Less choke coils	.50
3091	Board—Resistor board complete less resistors and capacitors	1.00
3092	Volume Control—Volume control complete with mounting nut	1.50
3093	Tone Control—Tone control complete with mounting nut	1.90
3095	Coil—R.F. coil	1.90
3096	Coil—1st detector and oscillator coil	3.55
3098	Capacitor—0.008 mfd	.50
3099	Capacitor—0.005 mfd	.75
3137	Knob—Tuning control, volume control and tone control knob—Package of 5	3.25
6179	Terminal—Single ground terminal with set screw—Complete with mounting rivet—Package of 5	.50
6186	Resistor—500,000 Ohms—Carbon type—¼ Watt—Package of 5	2.00
6188	Resistor—2 Megohm—Carbon type—½ Watt—Package of 5	2.00
6189	Bracket—Dial lamp bracket and indicator—Package of 2	.65
6190	Shaft—Tuning condenser drive shaft complete with 3 washers—Package of 5	.85
6191	Cord—Tuning condenser drive cord—Package of 5	.55
6192	Spring—Tuning condenser drive cord tension spring—Package of 10	.50
7054	Cord—Power cord	1.00
7062	Capacitor—Adjustable capacitor—15–70 mmfd	1.00
7266	Transformer—2nd intermediate transformer	3.00
7267	Transformer—1st intermediate transformer	3.00
7268	Coil—Choke coil	.60
7269	Capacitor—Comprising one 2.0 mfd., one 4.0 mfd., four 0.5 mfd., two 1.0 mfd., five 0.1 mfd., and one 0.05 mfd. capacitors in metal container	7.25
7270	Reactor—Filter reactor	4.00
7271	Transformer—Interstage transformer	4.25
7272	Transformer — Power transformer — 105–125 volts, 50–60 cycles	$12.00
7273	Capacitor—Comprising one 4.0 mfd., one 6.0 mfd., four 0.5 mfd., two 1.0 mfd., five 0.1 mfd. and one 0.05 mfd. capacitors in metal container—105–125 volts, 25–40 cycles	10.00
7274	Transformer—Power transformer—105–125 volts, 25–40 cycles	15.00
7275	Transformer—Power transformer—220 volts, 60 cycles	10.00
7438	Capacitor—Variable tuning capacitor	5.20
7439	Drum—Dial drum with screws and 3 scale mounting nuts	.50
7440	Scale—Dial and dial scale	.75
8871	Support — Receiver chassis metal mounting support—Package of 4	.75
	LOUDSPEAKER ASSEMBLY	
3237	Screw assembly—Speaker mounting screw assembly — Comprising 4 screws, 8 washers, 8 nuts and 4 eyelets—Package of 1 set	.50
7257	Coil assembly — Speaker field coil assembly — Comprising field coil, cone bracket and magnet	6.00
7258	Transformer—Output transformer	1.70
8559	Ring—Cone retaining ring	.80
8601	Cone—Speaker paper cone—Package of 5	15.00
	CABINET ASSEMBLY	
X-54	Post—Front post—R.H.	4.45
X-55	Post—Back post—R.H.	3.70
X-56	Post—Front post—L.H.	4.45
X-57	Post—Back post—L.H.	3.70
X-58	Post—Center post—R.H.	2.15
X-59	Post—Center post—L.H.	2.15
X-60	Panel—Control panel	3.85
X-61	Doors—R.H. and L.H. door—Package of 1 pair	7.20
X-62	Ornaments — Door ornaments — Comprising one Top L.H., one Top R.H. and 4 vertical mouldings—Package of 1 set	1.90
X-63	Top	6.20
X-64	Foot	1.05
X-65	Stretcher	5.50
X-66	Moulding—Front top moulding	1.25
X-67	Baffle board and grille cloth	.95
6210	Hinges—Door hinges—Comprising 4 hinges and 16 mounting screws—Package of 1 set	.90
6211	Pull—Door pull with mounting screw—Package of 4	1.20
7441	Escutcheon—Tuning dial escutcheon complete with mounting screws	1.05
9407	Cabinet—Cabinet complete less equipment	64.50

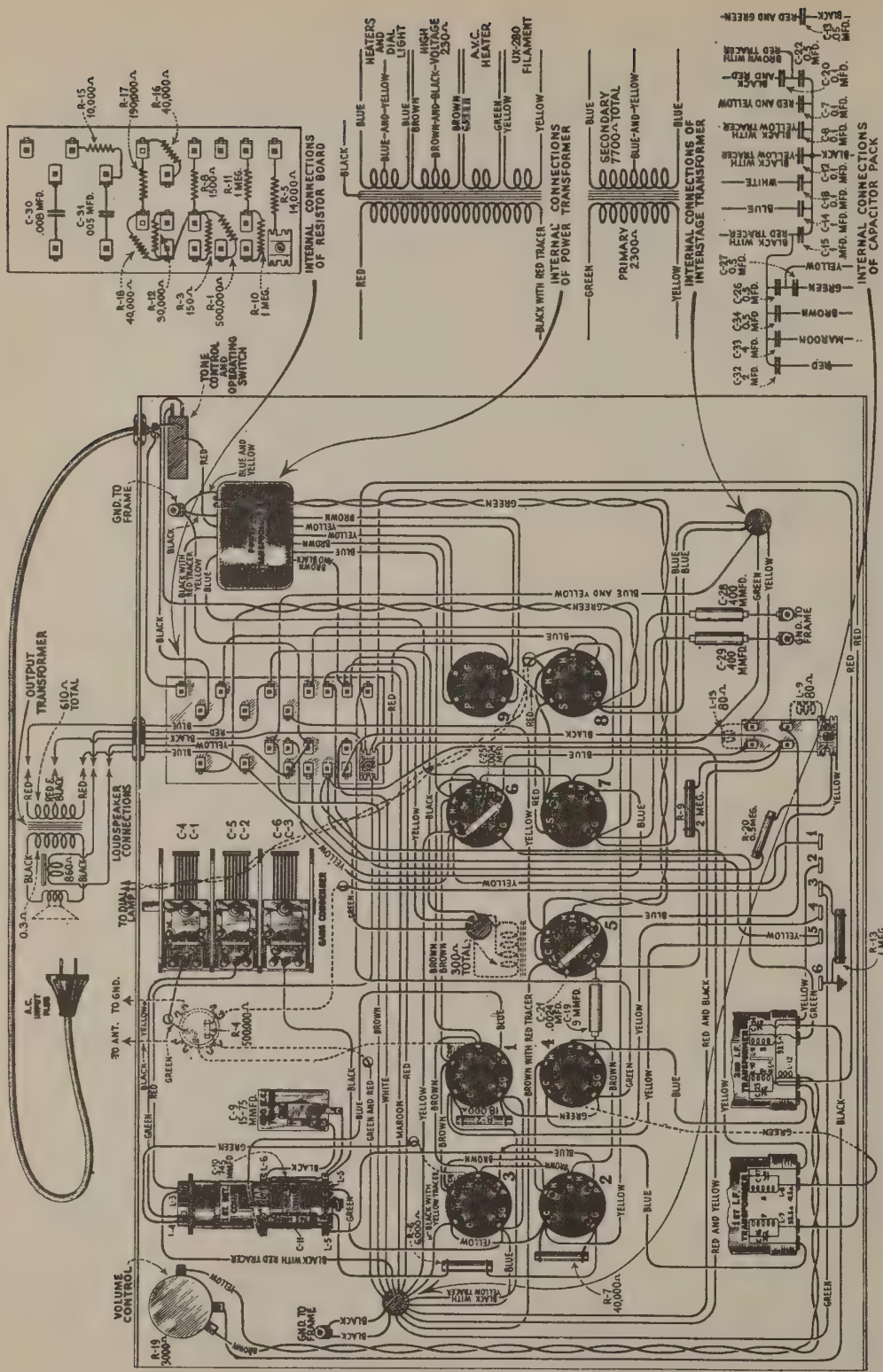


Figure 2—Wiring Diagram

Service Division

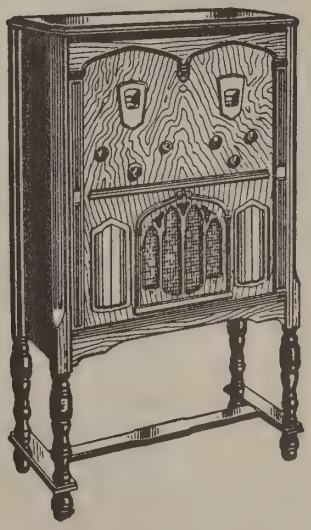
RCA Victor Company, Inc.

Camden, N. J., U. S. A.

S. O. 8736 10M—1-14-'32

RCA Victor
Universal Radiola RO-23

SERVICE NOTES



RCA Victor RO-23

[Second Edition 15C]
[Copyright, February, 1932]

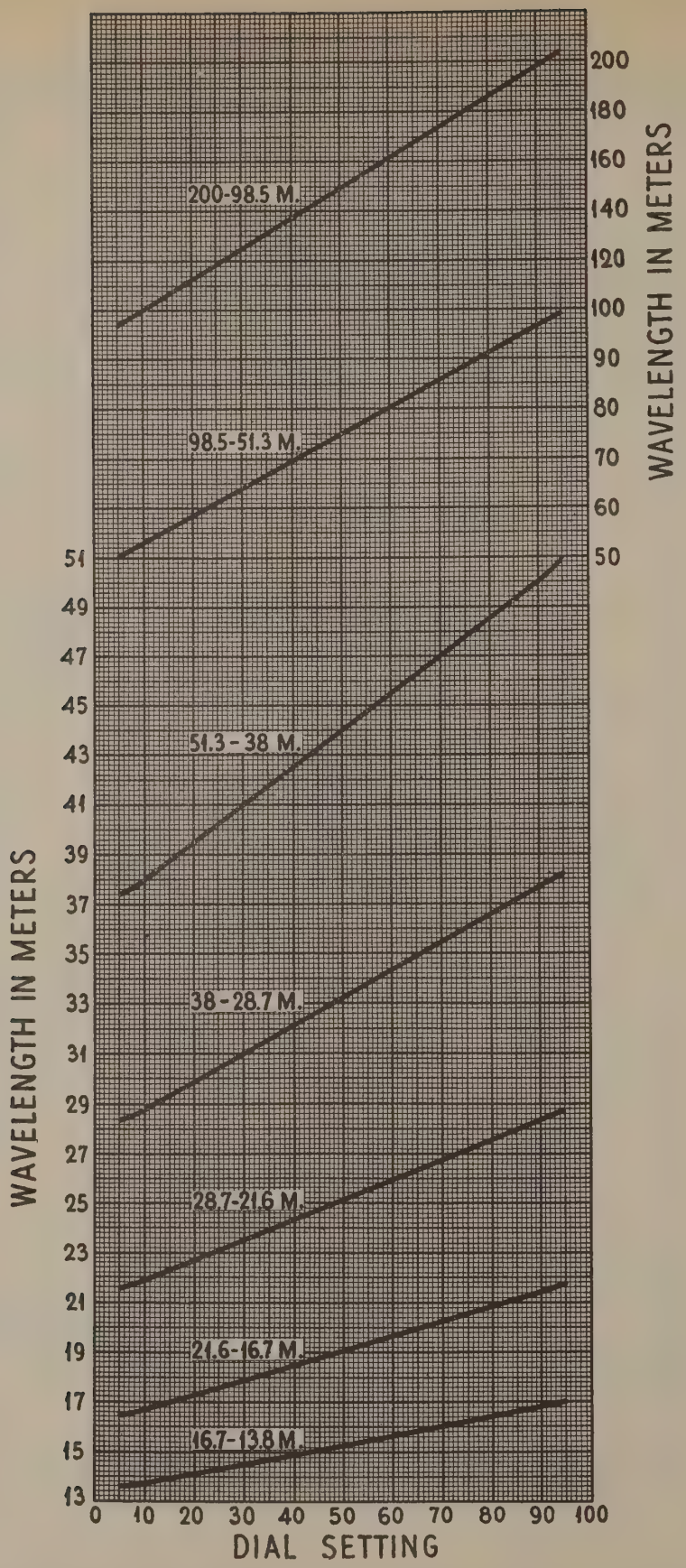
SERVICE DIVISION

RCA Victor Company, Inc.

Camden, N.J.

A RADIO CORPORATION OF AMERICA SUBSIDIARY

REPRESENTATIVES IN PRINCIPAL CITIES



Approximate Calibration of Short Wave Tuning Dial of RO-23 (with 1075 K.C. Intermediate Frequency).

SERVICE NOTES

for

RCA Victor

Universal Radiola RO-23

ELECTRICAL SPECIFICATIONS

Voltage Rating.....105–125 Volts and 200–250 Volts
Frequency Rating.....50–60 cycles and 25–40 cycles
Power Consumption.....120 Watts
Recommended Antenna Length.....25–75 feet
Type of Circuit (Broadcast)..... A. C. Screen Grid, Super-Heterodyne—8 Tubes
Type of Circuit (Short Wave)..... A. C. Screen Grid, Super-Heterodyne—11 Tubes
Number and types of Radiotrons (Broadcast)
2 RCA-235, 3 UY-227, 1 UY-224, 1 UX-280, 1 RCA-247
Number and types of Radiotrons (Short Wave)
Same as Broadcast band plus 2 UY-224 and 1 UY-227
Number of Radio Frequency stages (Broadcast Band).....1
Number of R. F. stages (Short Wave Converter).....2
Number of I. F. stages (Broadcast).....1
Number of I. F. stages (Short Wave).....2
Type of Second Detector.....Power Grid Bias
Type of Tone Control
Variable resistance in series with capacitor connected across secondary of interstage transformer
Number of Audio stages.....1 (Pentode)
Type of Rectifier.....Full Wave, UX-280
Type of Loudspeaker.....Dynamic
Wattage dissipation in L. S. Field.....10 Watts
Undistorted Output.....2.25 Watts

PHYSICAL SPECIFICATIONS

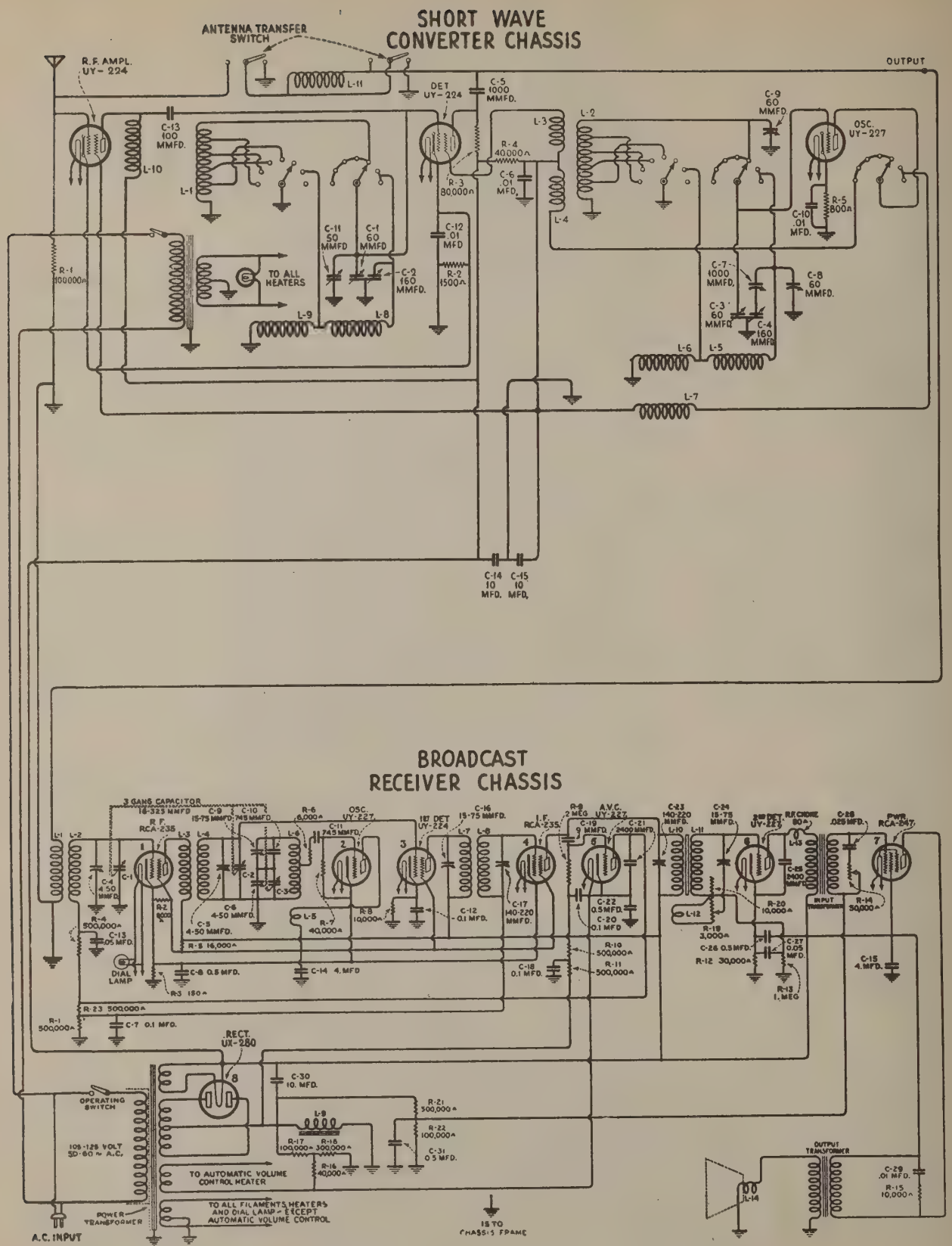
Height.....46 Inches
Depth.....$12\frac{13}{16}$ Inches
Width.....$27\frac{1}{4}$ Inches
Weight Alone.....76 lbs.
Weight packed for shipment.....127 lbs.

SERVICE DATA

Service information in conjunction with the broadcast receiver is covered in the Service Notes already issued on RCA-Victor Models R-8, R-10 or R-12. The Short Wave Converter is however somewhat different from the usual broadcast receiver and a discussion of its service problems will help the service man in the performance of his work.

ELECTRICAL DESCRIPTION OF CONVERTER CIRCUIT

The RCA Victor Short Wave Converter uses three Radiotrons. one UY-224 as an R. F. Amplifier, one UY-224 as a Detector and one UY-227 as an Oscillator. The purpose of the Converter is to amplify the incoming high frequency signal by means of the R. F. stage, beat it with a local Oscillator signal and produce a modulated beat frequency by means of the Detector, extract the beat frequency so that it may be amplified by means of the broadcast receiver. A special tuning Capacitor for tuning the Oscillator and Detector stages simultaneously, is incorporated in this unit. A series of tapped coils in conjunction with a range switch provides for the shifting to various bands without interchanging coils as with the older style Converters. Also this switch changes the capacity used by the tuning capacitor so that the frequency range of each band is approximately the same. A small trimmer capacitor, known as the Resonator, is used to re-align the detector circuit with the Oscillator whenever the band is changed or the I. F. frequency is shifted. The shaft that controls the Resonator capacitor is also mechanically connected to the operating switch and the antenna switch. It is so made that when the power is turned "off," the antenna is shifted to the broadcast receiver so that broadcast reception may be obtained.



Note—On some models operating switch for broadcast receiver is in circuit to Converter.

Figure 1—Schematic Circuit

(1) ALIGNMENT OF CONVERTER CIRCUITS

If the Converter does not cover the bands indicated on the range switch, refer to Figure 2 and make the following adjustments. A calibrated oscillator or frequency meter is desirable although if the service man is familiar with the stations in the high frequency spectrum, the location of these stations on the scale can be used as a guide for making the adjustments. Also a calibrated short-wave receiver that has an oscillating detector may be used to check the Converter oscillator frequency.

Adjust the broadcast receiver so that it is accurately set at 1075 K. C.—the short wave I. F. frequency. Set the "Range" switch at the 51.3–98.5 meter position.

Set the tuning capacitor at its minimum position. (Plates fully out of mesh.)

Place the external oscillator in operation at 5960 K. C.

Adjust the oscillator shunt capacitor C-8 so that the external oscillator will be heard in the loudspeaker or noted on an output meter.

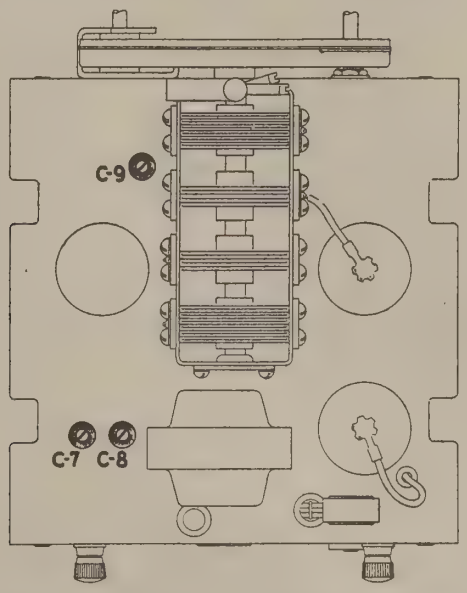


Figure 2—Location of Adjusting Capacitors

If the calibrated oscillator is not available then a calibrated receiver may be used to receive and check the frequency of the converter oscillator. The capacitor C-8 should be adjusted until the oscillator frequency is 7035 K. C.

If a wave meter is the only standard available, then a second receiver should be calibrated from it by means of one of the several methods for doing this accurately.

If no standards are available a satisfactory adjustment can be made by increasing capacitor C-8 slightly more than the point at which the 49 meter broadcasting stations are heard when the tuning capacitor is at its minimum position on the 51.3–98.5 meter band. (With C-8 set at minimum the 49 meter band should be received.)

Now shift the tuning capacitor to its maximum position. The Converter oscillator frequency as picked up on a calibrated receiver, should be adjusted for 4130 K. C. by the oscillator series capacitor C-7. So adjusted, the receiver will receive a 3055 K. C. signal with an intermediate frequency of 1075.

Again, if no standards are available, an adjustment of C-7 that will give a definite point of resonance near the center range of the Resonator control with the tuning dial at 50 will be satisfactory.

After checking each end of the 51.3 to 98.5 meter band, shift the range switch to the 38–51.3 meter position. Set the tuning capacitor at its minimum position (plates fully out of mesh) and the I. F. frequency at 1075. Adjust the oscillator shunt capacitor C-9 until the oscillator frequency is 9100 K. C. or the receiver will respond to a signal of 8025 K. C. If no standards are available, adjust C-9 until the 49 meter stations all fall within and near the center of the 49 meter markings on the dial. Unless this adjustment is properly made the short wave broadcasting will not fall within the bands marked on the dial.

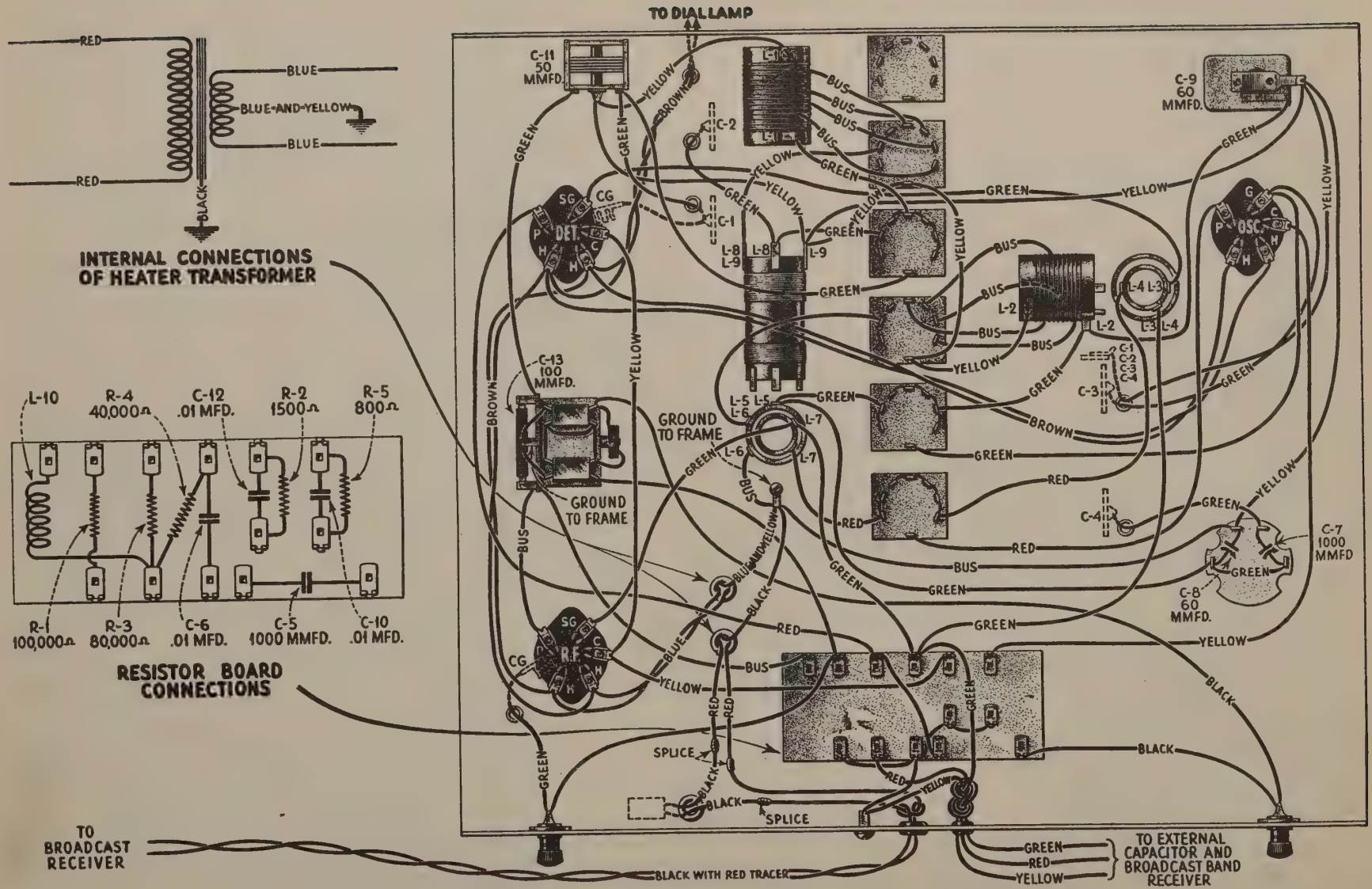


Figure 3—Wiring Diagram of Short Wave Converter

Alignment at each end of the 51.3–98.5 meter band are also for the 98.5–200 meter band. The other alignment is for the five high frequency ranges. When these alignments are properly made, and an intermediate frequency between 1050 and 1100 K. C. is used, the Resonator control will function properly and the various short wave broadcasting services will fall within the bands indicated on the dial.

Special Notes on Effects of Aligning and I. F. Frequency Changes

Unless the line-up adjustments are carefully and properly made, the dial markings will be found to be incorrect. If it is necessary to replace the oscillator coil, the leads on the new coil should be made as short as possible and the alignment of the set checked. Also during operation it is preferable that the I. F. frequency of 1075 be used although any frequency between 1050 and 1100 will be satisfactory.

In unusual cases where local conditions preclude the use of a frequency between 1050 and 1100 K. C., considerably more variation in I. F. frequency without the loss of sensitivity will be permissible. However, the calibration will be shifted considerably, especially at the lower frequencies.

(2) DIAL INDICATOR

The indicator on the dial lamp should be so adjusted that the dial will read 100 when the tuning capacitor is at its maximum capacity position. It is important that this be checked before any alignment adjustments are made.

(3) BROADCASTING STATION HARMONICS

When tuning on the 98.5–200 meter band, the second and third harmonics of broadcasting stations will be heard and as there is no regular short wave broadcasting service on this band such signals may be discounted as better results will be obtained by listening to such programs on their regular wave band.

On the lower length bands, the short wave broadcasting stations will be received in the bands indicated for each position of the range switch with but few exceptions. Broadcasting received at other positions of the dial should therefore be viewed with skepticism unless it is definitely proved to be a short wave station and not a higher harmonic of a broadcast station.

(4) LOCAL STATION INTERFERENCE

When the receiver is located very close to a powerful transmitter, either broadcasting or code it is recommended that an antenna not exceeding 30 feet in length be used. However, if a longer antenna is necessary in order to obtain satisfactory reception, cross modulation from the local station may occur. Such a condition is evidenced by the local station coming in on unmodulated carriers on top of some short wave stations.

Under such conditions, it is advisable to use a tuned input circuit to the short Wave Converter. Such an input circuit can readily be made by winding 3 turns of No. 20 wire on a 1¼ inch tube, spacing the turns ⅛ inch apart. The coil is tuned by means of a .0005 mfd. variable capacitor and should be connected from the antenna input to ground. Such a combination will tune broadly from 13.8 to 51 meters.

(5) ACOUSTIC FEEDBACK

If Acoustic feedback is experienced, it is an indication that the two chassis are not entirely supported on rubber. While with the usual broadcast receiver, such a condition is not so vitally necessary, with high frequency reception, unless each chassis is entirely floating in its rubber mounting and its shafts and knobs not touching the cabinet, howling will result.

(6) BROADCAST RECEIVER HARMONICS

When tuning through the various bands, at various points a slight breathing tone can be heard that is not a C. W. signal, but a harmonic of the broadcast receiver oscillator, being received. If an intermediate frequency of between 1050 and 1100 is used, these will not fall on any of the short wave broadcasting services. However, if they should and thereby cause a whistle, a slight shift —5 kilocycles of the intermediate frequency—will eliminate the interference. Retuning the Short Wave Converter will be necessary to restore the signal to its normal intensity. Identification of these harmonics can be made by this means, a slight shift in the intermediate frequency causing them to disappear while an incoming signal will slowly diminish in volume.

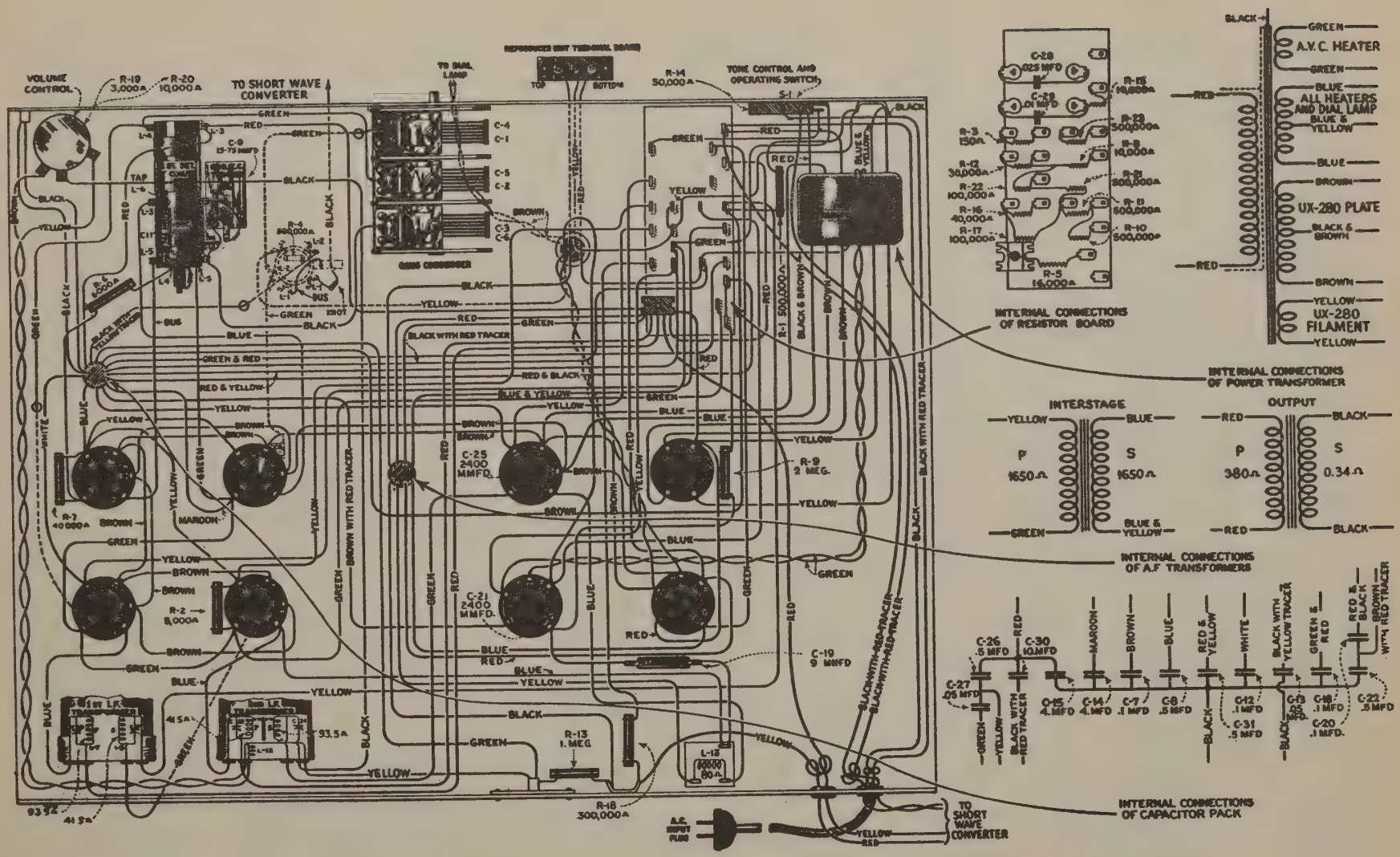


Figure 4—Wiring Diagram of Broadcast Band Receiver

(7) C. W. RECEPTION

Normally C. W. transmitters will not be heard unless they are modulated. However, such reception can be obtained by coupling an external oscillator loosely to the second detector of the broadcast receiver. This oscillator should be at about 174 or 176 K. C. so that a pleasing beat note will be obtained. Also a beat note may be obtained by means of an oscillator, the frequency of which is at the 1st I. F. frequency—1150 to 1100 K. C.—and loosely coupled to the input of the Broadcast receiver chassis.

(8) HUM

In addition to the usual causes of hum in the broadcast receiver, the following points should be checked in relation to hum in the Short Wave Converter.

(a) A. C. input cord near antenna wire. Keep these two leads separate as much as possible.

(b) Slack in A. C. cord has been placed close to Converter chassis. Take up the slack near the outlet, not near the Converter.

(c) Filament transformer center tap not connected.

(d) One side of filament transformer grounded, thereby shorting one section of the secondary.

(9) RANGE SWITCH

A defective "Range" switch may cause any of the following conditions:

(a) Noise. A corroded or loose wire or contact may cause excessive noise even when the switch is not being shifted. Check by removing the antenna to see if the noise decreases.

(b) Resonator control not effective. Check the detector sections—1 and 3 from the front—for faulty contacts.

(c) Oscillator not functioning. Check the oscillator sections—2, 4 and 5 from the front.

(d) Shift of dial readings. Check for corroded or loose connections.

(10) ANTENNA RESONANCE COIL

An open antenna resonance coil will lower the sensitivity of short wave reception. Its purpose is to match the output of the Converter to the input of the broadcast receiver.

(11) ANTENNA TRANSFER SWITCH

The Resonator Control shaft also is used to shift the antenna from the Short Wave Converter to the broadcast receiver. Also the power switch to the converter is operated simultaneously. A failure of these switches will usually be due to the failure of the engaging lever to throw the switch. If such a condition develops, the switch may be raised so that it properly engages with the operating arm on the shaft. See that no oil or grease prevents proper connection to the shaft at the friction bearing or noise will result when the Resonator is adjusted.

(12) FLUTTER

Fluttering may be caused by either of the following:

(a) Open capacitor C-14 or C-15. The purpose of these capacitors is to prevent flutter that may be encountered in a single Pentode receiver.

(b) Antenna lead close to detector Radiotron. See that this lead is in its proper position and removed from the detector Radiotron in the Converter.

(13) VOLTAGE READINGS

The following voltages are obtained at the Converter Radiotron sockets when measured with the usual set analyzers.

RADIOTRON SOCKET VOLTAGES

120 Volt A. C. Line

Radiotron No.	Control Grid to Cathode Volts D. C.	Screen Grid to Cathode Volts D. C.	Plate to Cathode Volts D. C.	Plate M. A.	Heater Volts A. C.
R. F.	—3	50	260	1.0	2.66
Detector	—3	50	180	1.0	2.66
Oscillator	—5	—	50	5.0	2.66

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
	LONG WAVE RECEIVER	
2563	Resistor—6,000 ohms—Carbon type—1 watt—Package of 5	$3.00
2730	Resistor—18,000 ohms—Carbon type—1 watt—Package of 5	2.00
2746	Socket—Dial lamp socket	.50
2747	Cap—Grid contactor caps—Package of 5	.50
2749	Capacitor—2400 mmfd.	1.50
2882	Socket—UY Radiotron socket complete with insulation strip	.50
2968	Socket—UX Radiotron socket—Complete with insulation strip	.50
2970	Resistor — 500,000 ohms — Carbon type—1 watt—Package of 5	2.50
2977	Knob—Tuning control, volume control or tone control knob—Package of 5	2.50
3003	Cushion — Receiver chassis rubber cushion—Package of 4	.50
3024	Capacitor—9 mmfd.—Package of 2	.50
3029	Bracket—Dial lamp bracket and indicator	.50
3045	Resistor—40,000 ohms—Carbon type—1 watt—Package of 5	2.50
3048	Resistor — 500,000 ohms — Carbon type—½ watt—Package of 5	2.50
3049	Resistor—150 ohms—Carbon type—½ watt—Package of 5	2.50
3056	Shield — Radiotron shield — Package of 2	.50
3076	Resistor—1 megohm—Carbon type—½ watt—Package of 5	2.50
3077	Resistor—30,000 ohms—Carbon type—½ watt—Package of 5	2.50
3078	Resistor—10,000 ohms—Carbon type—½ watt—Package of 5	2.50
3079	Resistor—40,000 ohms—Carbon type—½ watt—Package of 5	2.50
3081	Resistor—16,000 ohms—Carbon type 3 watt	.60
3092	Volume control—Volume control complete with mounting nut	1.50
3093	Tone control—Tone control complete with mounting nut	1.90
3095	Coil—R.F. coil	1.90
3235	Coil—1st detector and oscillator coil	2.85
3251	Coil—Choke coil	.90
3284	Board—Terminal board with 1 soldering terminal—Package of 5	.90
3285	Cord—Drive cord—Package of 5	1.00
3286	Spring—Drive cord tension spring—Package of 5	1.40
6185	Resistor — 100,000 ohms — Carbon—½ watt—Package of 5	2.00
6186	Resistor — 500,000 ohms — Carbon type—¼ watt—Package of 5	2.00
6187	Resistor — 300,000 ohms — Carbon type—½ watt—Package of 5	$2.00
6188	Resistor—2 megohm—Carbon type—½ watt—Package of 5	2.00
7054	Cord—Power cord	1.00
7062	Capacitor—Adjustable capacitor 15–70 mmfd.	1.00
7298	Capacitor—0.01 mfd.	.80
7299	Capacitor—745 mmfd.	.70
7340	Transformer—1st Intermediate transformer	3.00
7341	Transformer—2nd Intermediate transformer	3.00
7342	Capacitor—Comprising two 0.05 mfd., four 0.5 mfd., one 10.0 mfd., two 4.0 mfd. and four 0.1 mfd. capacitors in metal container	7.85
7343	Transformer—Audio transformer	3.85
7344	Transformer — Power transformer — 110 volts—60 cycles	8.00
7348	Board—Resistor board complete less resistors and capacitor	2.30
7362	Capacitor—0.025 mfd.	1.00
7404	Drum—Dial drum and scale	1.20
7405	Capacitor—20 mfd. electrolytic capacitor—In metal container	5.00
8770	Transformer — Power transformer — 25 cycles	12.00
8771	Transformer — Power transformer — 220 volts—60 cycles	9.00
8805	Capacitor—Variable tuning capacitor	6.00
8837	Support — Receiver chassis metal mounting support—Package of 4	.70
	LOUDSPEAKER ASSEMBLY	
3237	Loudspeaker mounting screw assembly—Comprising 4 screws, 8 nuts, 8 washers and 4 eyelets—Package of 1 set	.50
7345	Coil assembly—Comprising field coil, cone bracket and magnet	5.00
8559	Ring—Cone retaining ring	.80
8601	Cone—Speaker cone—Package of 5	15.00
	SHORT WAVE RECEIVER	
2747	Cap—Grid contactor cap—Package of 5	.50
2977	Knob—Station selector or Resonator knob—Package of 5	2.50
3058	Resistor — 100,000 ohms — Carbon type—1 watt—Package of 5	2.50
3153	Resistor—1500 ohms—Carbon type—1 watt—Package of 5	2.75
3285	Cord—Drive cord—Package of 5	1.00
3286	Spring—Drive cord tension spring—Package of 5	1.40

REPLACEMENT PARTS (Continued)

Stock No.	DESCRIPTION	List Price
	SHORT WAVE RECEIVER —Continued	
3288	Socket—UY Radiotron socket—Complete with insulation strip	$ .50
3289	Contact lug—Complete with mounting rivet—Package of 10	.50
3290	Switch—"Off and On"—Toggle switch complete with mounting nut	1.00
3291	Board—Terminal board with two soldering terminals complete with mounting rivets—For switch and bracket assembly—Package of 5	.50
3292	Drive shaft and pulley—Package of 5	2.35
3293	Coil—For resistor board assembly	.65
6100	Coil—Coil assembly complete with mounting eyelet—For switch and bracket assembly	.75
6101	Socket—Dial lamp socket and bracket with mounting rivets	.50
6102	Capacitor—1000 mmfd.—Package of 5	2.50
6103	Resistor—800 ohms—Carbon type—1 watt—Package of 5	2.00
6104	Resistor—80,000 ohms—Carbon type 1 watt—Package of 5	2.00
6105	Resistor—40,000 ohms—Carbon type 3 watt—Package of 5	2.00
6106	Coupling—Switch lever shaft coupling bushing with 2 groove pins—Package of 5	.50
6107	Switch — Antenna transfer toggle switch	1.00
6108	Binding post—Complete with terminal lug, mounting washer and nut—Package of 5	1.75
6109	Knob—Knob with pointer—Package of 5	1.75
6110	Dial lamp shield and indicator	.50
6111	Escutcheon—Band selector switch knob escutcheon—Package of 5	1.80
6112	Cushion — Receiver chassis rubber cushion—Package of 4	.50
7062	Capacitor — Adjustable capacitor — 15–70 mmfd.	1.00
7298	Capacitor—0.01 mfd.	.80
7406	Capacitor—Double adjustable capacitor—One section 10–70 mmfd., one section 800–1000 mmfd.	1.10
7407	Coil—High frequency detector coil	$1.05
7408	Coil—Low frequency detector and oscillator coil	1.45
7409	Coil—High frequency oscillator coil	1.85
7410	Capacitor—Variable capacitor 7 plate—Complete with mounting nut and washer	1.75
8806	Transformer—Filament power transformer	3.25
8807	Transformer—Filament power transformer—105–120 volts, 25 cycles	5.75
8808	Transformer—Filament power transformer—220 volts, 60 cycles	3.40
8809	Board—Resistor board less resistors, capacitors and coil	1.00
8810	Lever—Switch lever assembly—Comprising shaft, 3 switch levers and coupling bushing	.70
8811	Switch—Band selector switch complete with mounting washer and nut	6.60
8812	Capacitor—Tuning capacitor assembly	5.10
8813	Dial drum and scale	1.20
8837	Support — Chassis metal mounting support—Package of 4	.70
10820	Capacitor—100 mmfd.	.50
	CABINET ASSEMBLY	
X-24	Top	7.00
X-25	Stretcher—Comprising R. H. and L. H. end rails and center rail	4.10
X-26	Leg	4.15
X-27	Foot assembly — Comprising foot, hanger bolt, packing nut and ferrule—Assembled	1.45
X-28	Baffle board and grille cloth	1.35
X-29	Escutcheon—Tuning dial escutcheon for long wave	1.60
X-30	Escutcheon—Tuning dial escutcheon for short wave	1.60
3223	Escutcheon—Metal bezel for dial	.50
3287	Label—Metal trade mark label—Package of 5	.75
9398	Cabinet—Cabinet complete less equipment	77.25

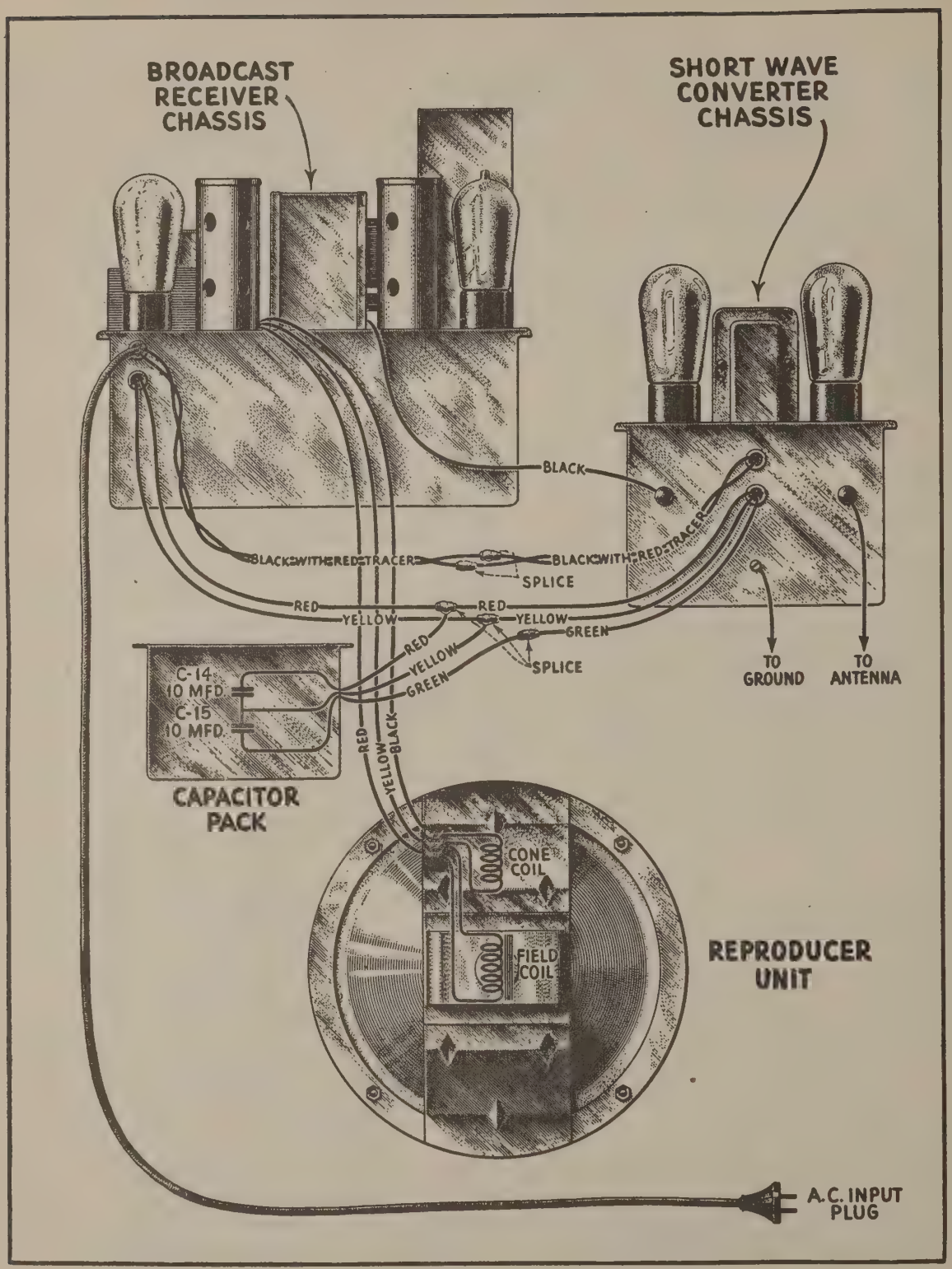


Figure 5—Assembly Wiring

S. O. 8955 15C 3-2-'32

SERVICE NOTES
for
RCA Victor RAE-26

RCA Victor Radiola Automatic Electrola RAE-26 is a nine tube radio receiver combined with the perfected RCA Victor Automatic Record Changing Mechanism. Features of the radio receiver are excellent sensitivity, selectivity and tone quality, automatic volume control that is quiet when tuning from station to station and Pentode Output Radiotrons.

The Automatic Record Changing Mechanism provides for the continuous playing of ten 10-inch records. Provision is also made for a turntable speed of 33⅓ R.P.M. as well as 78 R.P.M. This makes the mechanism adaptable for the playing of the Program Transcription Records as well as standard records, either manually or automatically.

SERVICE DATA

The Receiver assembly and Loudspeaker used in Model RAE-26 is exactly the same as that used in the R-11. A reference to the Service Notes for the R-11 will therefore give the details of any Service information required on these units.

A reference to the Service Notes on the RCA Victor Automatic Record Changing Mechanism gives details of any service work that may be required on this unit. It will also be found useful in identifying the replacement parts listed below. Figure 1 shows the schematic circuit diagram and Figure 2 the assembly wiring diagram.

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
	REPRODUCER	
3166	Bolt assembly—Reproducer mounting bolt assembly—Comprising two bolts, two plates, two lock washers and two nuts	$1.05
7257	Coil assembly—Comprising reproducer field coil, cone bracket and magnet	6.00
7258	Transformer—Output transformer	1.70
8559	Ring—Cone retaining ring	.80
8601	Cone—Reproducer paper cone—Package of 5	15.00
	RECEIVER	
2563	Resistor—6,000 Ohms—Carbon type—Package of 5	3.00
2730	Resistor—18,000 Ohms—Carbon type—Package of 5	2.00
2734	Capacitor—745 Mmfd.—Package of 5	2.20
2746	Socket—Dial lamp socket	.50
2747	Cap—Grid contact cap—Package of 5	.50
2749	Capacitor—2,400 Mmfd.	1.50
2882	Socket—UY Radiotron socket with insulator—8 used	.50
2968	Socket—UX Radiotron socket with insulator—1 used	.50
2999	Shaft—Dial drum drive shaft	.50
3029	Bracket—Tuning dial indicator—Complete with bracket	.50
3046	Resistor—190,000 Ohms—Carbon type—Package of 5	2.50
3047	Resistor—1,500 Ohms—Carbon type—Package of 5	2.50
3048	Resistor—500,000 Ohms—Carbon type—Package of 5	2.50
3049	Resistor—150 Ohms—Carbon type—Package of 5	2.50
3050	Resistor—14,000 Ohms—Carbon type	.60
3051	Resistor—5 megohm—Carbon type—Package of 5	2.00
3053	Capacitor—9 Mmfd.—Package of 2	.50
3055	Cushion—Chassis support cushion—Package of 4	.50
3056	Shield—Radiotron shield—6 used—Package of 2	.50
3076	Resistor—1 megohm—Carbon type—Package of 5	2.50
3077	Resistor—30,000 Ohms—Carbon type—Package of 5	2.50
3078	Resistor—10,000 Ohms—Carbon type—Package of 5	2.50
3079	Resistor—40,000 Ohms—Carbon type—Package of 5	2.50
3085	Capacitor—400 Mmfd.	.60
3089	Terminal Board—Magnetic pickup terminal board	0.50
3090	Board—A.V.C. and 2d detector R. F. choke mounting board—less choke coils	.50
3091	Board—Resistor terminal board less capacitors and resistors	1.00
3092	Control—Radio volume control complete with mounting nut	$1.50
3093	Control—Tone control and operating switch complete with mounting nut	1.90
3094	Shield—Radiotron shield—1 used—Package of 2	.50
3095	Coil—R. F. Coil—Complete with mounting bracket	1.90
3096	Coil—1st detector and oscillator coil—Complete with mounting bracket	3.55
3097	Dial—Dial scale and drum—Assembled—Package of 2	.50
3098	Capacitor—Capacity 0.008 MFD	.50
3099	Capacitor—Capacity 0.005 MFD	.75
3137	Knobs—Package of 5	3.25
3156	Label—Metal trade mark label—Package of 5	2.50
3175	Receptacle—Needle receptacle	.75
3184	Terminal board—Pickup terminal board	.50
3189	Box—Needle box with lid—Package of 2	.70
3221	Cable—Shielded cable from record volume control to pickup terminal board—Package of 2	.80
3224	Switch—Record-Radio switch with mounting nut and washer	1.35
7054	Cord—Power cord	1.00
7062	Capacitor—Adjustable oscillator trimmer capacitor	1.00
7232	Cable—Main cable from receiver to input transformer, radio record switch and record volume control	2.30
7241	Capacitor—3 gang tuning capacitor with mounting screws and washers	8.00
7266	Transformer—1st Intermediate transformer	3.00
7267	Transformer—2d Intermediate transformer	3.00
7268	Coil—Detector or A.V.C. R. F. Choke coil	.60
7269	Capacitor Pack—Comprising one 2.0 Mfd., one 0.4 Mfd., five 0.5 Mfd., two 1.0 Mfd. and five 0.1 Mfd. Capacitors in metal containers—110 volts—50-60 cycles	7.25
7270	Reactor—Filter reactor	4.00
7271	Transformer—Interstage transformer	4.25
7272	Transformer—Power transformer—105-125 volts, 50-60 cycles	12.00
7273	Capacitor Pack—Comprising one 4.0 Mfd., one 7.0 Mfd., five 0.5 Mfd., two 1.0 Mfd. and five 0.1 Mfd., capacitors in metal container—110 volts, 25-40 cycles	10.00

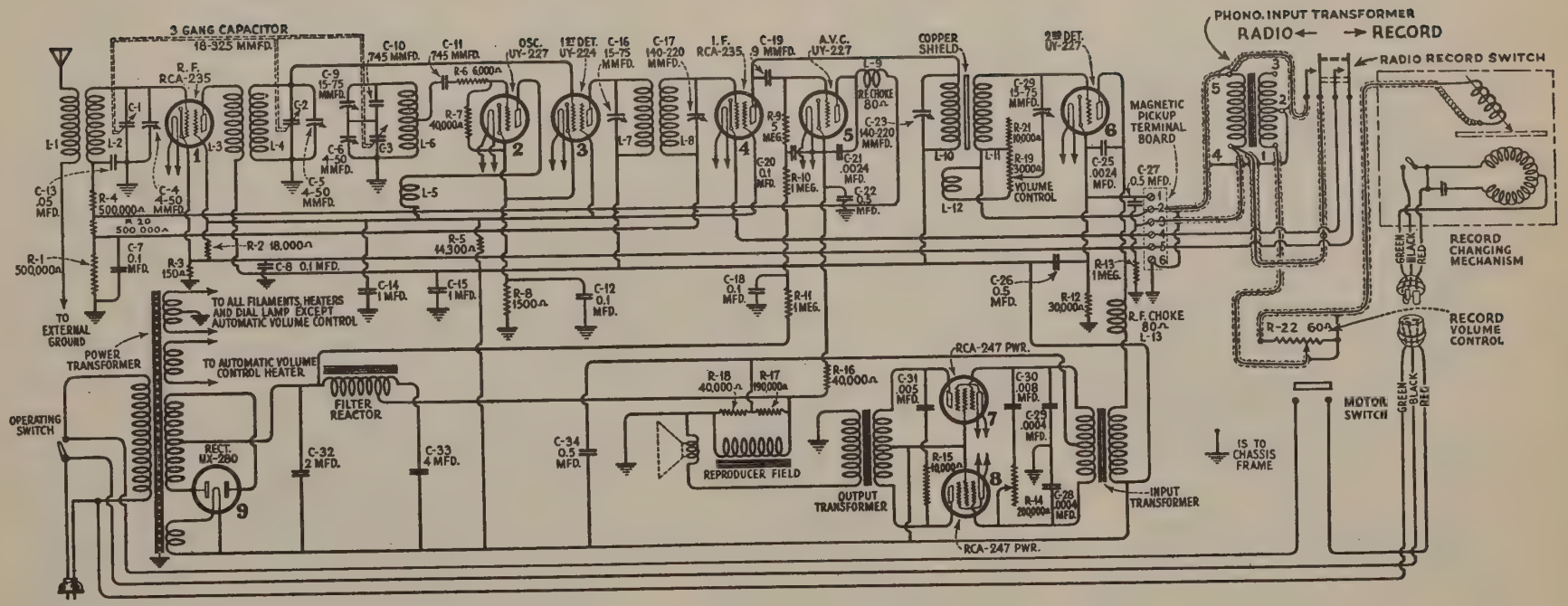


Figure 1—Schematic Circuit Diagram of RAE-26

REPLACEMENT PARTS (Continued)

Stock No.	DESCRIPTION	List Price
	RECEIVER—Continued	
7274	Transformer—Power transformer—105-125 volts, 25-40 cycles	$15.00
7312	Transformer—Pickup input transformer	6.55
8761	Support—Lid support	1.50
	MOTOR BOARD AND AUTOMATIC RECORD CHANGER	
2614	Switch	1.40
2620	Cushion—Pickup rubber cushions—Comprising two pivots and one damper cushion—Package of 5 sets	1.25
2767	Spring—Pickup magnet spring—Package of 10	.50
2768	Armature—Pickup armature	.50
2769	Coil—Pickup coil	.50
2770	Plate—Pickup damper plate—Package of 5	.50
2771	Screw—Pickup damper plate mounting screw—Package of 10	.50
2857	Plug—Three way male connector plug	.70
2893	Spring—Trip lever spring—Package of 10	.60
2896	Spring—Cable lever spring—Package of 10	.50
2897	Screw and nut—Pickup arm cable adjusting screw and nut—Package of 5	.50
2898	Screw and nut—Adjusting screw and nut for elevator shafts—Package of 10	.50
2902	Screw and nut—Motor turntable spindle thrust screw and nut—Package of 10	.50
2903	Screw—Motor mounting screw—Package of 10	.50
2904	Lever—Front elevator actuating lever	.50
2905	Screw—Gear and bracket mounting screw—Package of 10	.50
2906	Spring—Check lever spring—Package of 10	.50
2907	Screw—Clutch set screw—Package of 10	.50
2908	Spring—Gear reducing pawl spring—Package of 10	.50
2909	Spring—Four finger lever spring—$1\frac{5}{16}$" long—Package of 10	.60
2910	Spring—Four finger lever spring—$1\frac{7}{16}$" long—Package of 10	.60
2911	Screw—Slide bracket screw—Package of 10	.50
2912	Roller—Slide roller complete with screw stud—Package of 5	1.50
2913	Spring—Cable lever spring—Package of 10	.60
2914	Spring—Flat spring with screws—Package of 10	.50
2915	Spring—Locating lever spring—Package of 10	.50
2916	Plate—Latch plate with mounting screws—Package of 5	.60
2917	Washer—Spring washer—Package of 10	.50
2918	Spring—Index lever spring—Package of 10	.50
2919	Screw and nut—Stop screw and nut—Package of 10	.50
2920	Washer—Friction washer—Package of 10	.50
2929	Lever—Rear elevator actuating lever—Package of 2	.50
3052	Screw assembly—Pickup pole shoe mounting screw, nut and washer—Package of 10 sets	.50
3159	Friction brake—Gear reducing friction brake spring and pad with mounting rivet—Package of 4	2.00
3161	Spring—Shift lever spring—Package of 5	1.20
3167	Magnet—Pickup magnet	2.60
3169	Pole shoe—Pickup pole shoe—R. H.	1.45
3170	Pole shoe—Pickup pole shoe—L. H.	1.45
3173	Plug—Three way female cord plug	1.30
3186	Control—Record volume control and switch with mounting nut and washer	2.20
3190	Clutch pawl	1.25
3191	Ratchet—Ratchet and gear with set screw	.90
3192	Post—Roller post assembly—for supporting magazine	.75
3193	Screw—Magazine bearing mounting screw and nut—Package of 10	.50
3194	Screw—Pickup arm base mounting screw and nut—Package of 10	.50
3195	Lever—Record transfer lever with screws and nuts	1.65
3196	Screw—Record transfer lever mounting screw and nut—Package of 10	.50
3197	Escutcheon—Turntable speed escutcheon plate with mounting rivets—Package of 2	.70
3198	Bushing—Insulating rubber bushing—Package of 10	.50
3199	Screw—Bottom plate mounting screw—Package of 10	.50
3200	Shaft—Front or rear elevator shaft	.80
3201	Rear elevator pad—Package of 5	2.75
3202	Front elevator pad—Package of 5	3.00
3203	Screw—Elevator pad mounting screw—Package of 10	.50
3204	Cable—Pickup arm cable—Package of 5	1.50
3205	Screw—Pickup needle holder screw—Package of 10	.80
3206	Cover—Pickup cover	.75
3207	Screw—Pickup cover mounting screw—Package of 10	$0.50
3208	Screw assembly—Pickup mounting screw, nut and washer—Package of 10	.60
3209	Lever—Trip lever	1.10
3210	Lever—Magazine lever	.65
3211	Washer—Turntable spindle leather washer—Package of 10	.50
3212	Spring—Turntable spindle plunger spring—Package of 10	.50
3213	Bolt—Motor board mounting bolt—Package of 8	.90
3214	Pulley—Cable pulley and mounting stud—Package of 5	.50
3217	Lever—Check lever	.50
3261	Cap—Rubber cap for turntable spindle—Package of 5	.50
3262	Screw and nut—Record transfer lever adjusting screw and nut—Package of 10	.60
7151	Back—Pickup back housing	.50
7186	Gear—Intermediate gear and bracket	1.40
7188	Bracket—Slide bracket with roller	.75
7189	Lever—Front and rear elevator cam lever—Package of 5	2.20
7190	Lever—Locating lever	.85
7191	Lever—Cable lever	.60
7192	Cam—Cam gear and cam	1.50
7194	Rotor and shaft—60 cycles	8.00
7204	Rotor and shaft—50 cycles	8.00
7305	Gear reducing unit complete	4.50
7315	Spindle and gear—Turntable spindle with gear—25 cycles	6.00
7316	Spindle and gear—Turntable spindle with gear—30 cycles	6.00
7317	Spindle and gear—Turntable spindle with gear—50 cycles	5.00
7318	Spindle and gear—Turntable spindle with gear—60 cycles	5.00
7319	Rotor and shaft—25 cycles	10.00
7320	Rotor and shaft—30 cycles	10.00
7321	Lever—Cable guide lever with pulley	.90
7322	Lever—Manual Index lever	.60
7323	Magazine bearing—Located on top of motor board	1.35
7324	Pickup arm base	.85
7325	Pickup—Pickup unit complete	12.50
7326	Turntable cover	.50
7330	Capacitor—Motor capacitor—3.75 Mfd.—For 25 or 30 cycles	4.00
7363	Pad—Rubber pad for front elevator—Package of 10	.50
7364	Lever—Speed reducing shift lever	.50
8644	Capacitor—Motor capacitor—1.25 Mfd.—For 110 volts, 50 or 60 cycles	1.40
8646	Slide—Main slide	2.20
8647	Lever—Four finger lever	1.20
8752	Motor—Motor complete—25 cycles	41.00
8753	Motor—Motor complete—30 cycles	41.00
8754	Motor—Motor complete—50 cycles	41.00
8755	Motor—Motor complete—60 cycles	33.50
8756	Motor board—Motor board assembled with elevator bushings, turntable speed plate and shift lever	5.50
8757	Arm—Pickup arm complete with weight—Less pickup unit	6.00
8758	Record Magazine	4.00
8759	Turntable—Turntable with cover	5.00
	CABINET	
2776	Catch—Door catch and strike with nail—Package of 2	.50
2785	Hinge—Lid hinge with mounting screws—Package of 2	.50
3222	Knob—Door knob—Package of 2	1.10
3223	Escutcheon—Metal escutcheon	.50
7095	Hinge—Door hinge—Set of 4	1.00
7333	Mouldings—Front top rail end moulding—R. H. and L. H.—Package of 1 set	3.50
7334	Foot	1.00
7335	Escutcheon—Wood escutcheon	1.50
8762	Baffle board and grill cloth	1.20
8763	Stretcher rail	6.95
8764	Moulding—Front top rail center moulding	3.55
8765	Leg	3.75
8766	Doors—R. H. and L. H. end doors—Package of 1 pair	9.50
8767	Mouldings—Control panel mouldings—Set of 9 pieces	2.25
9388	Cabinet—Cabinet complete less equipment	110.60
9389	Lid—Assembled	12.80
9390	Control Panel	9.45

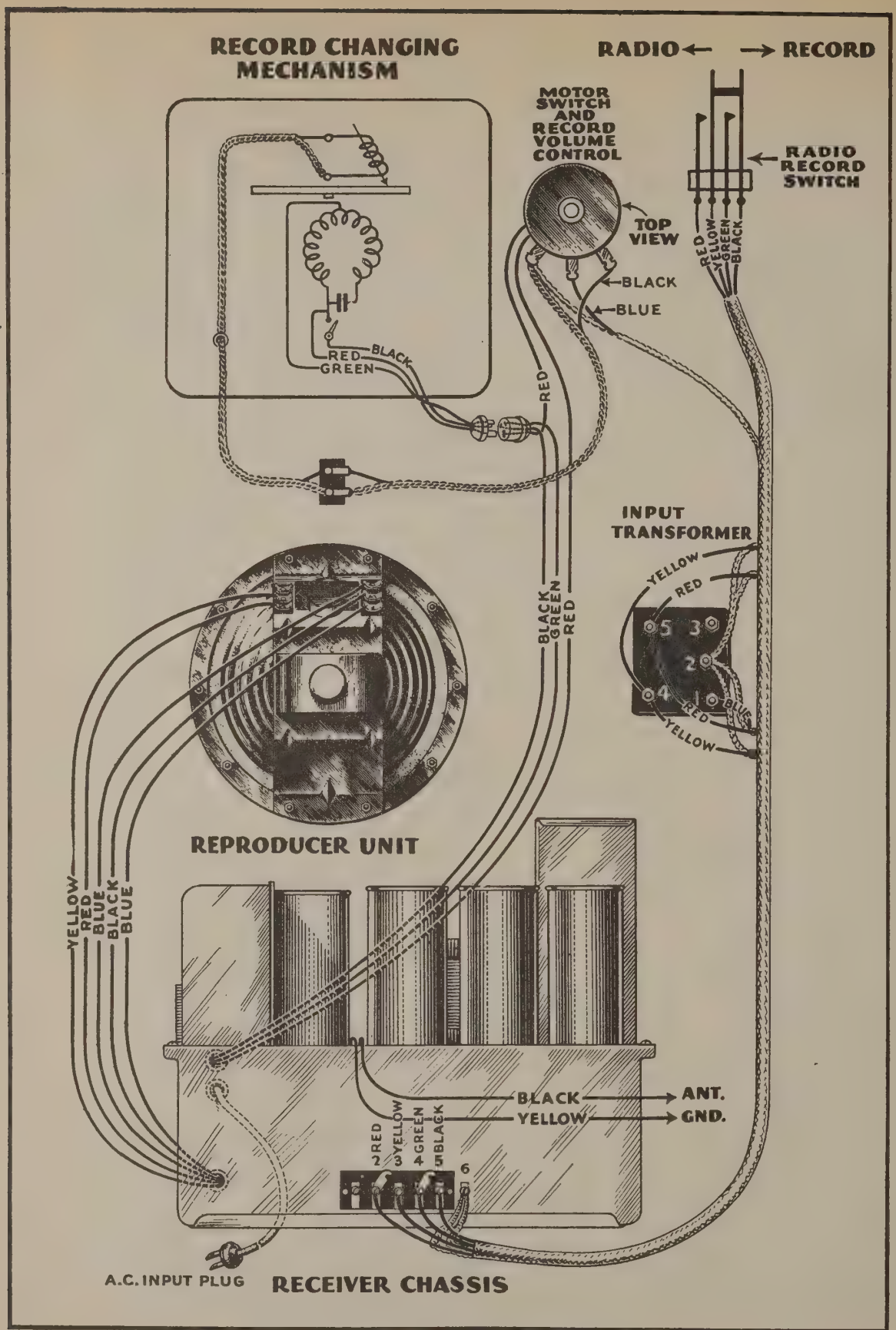
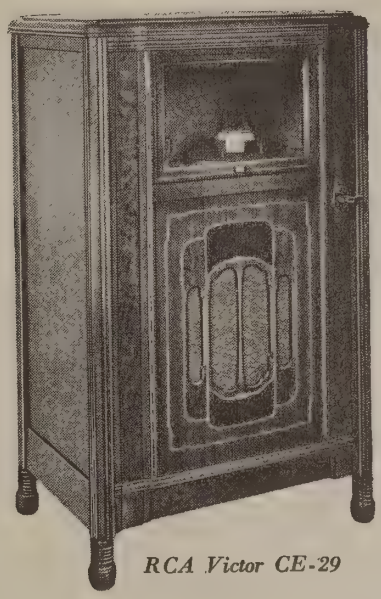


Figure 2—Assembly Wiring Diagram of RAE-26

RCA Victor

Coin Operated Automatic Electrola Model CE-29

SERVICE NOTES



RCA Victor CE-29

SERVICE DIVISION

RCA Victor Company, Inc.

Camden, N.J.

A RADIO CORPORATION OF AMERICA SUBSIDIARY

REPRESENTATIVES IN PRINCIPAL CITIES

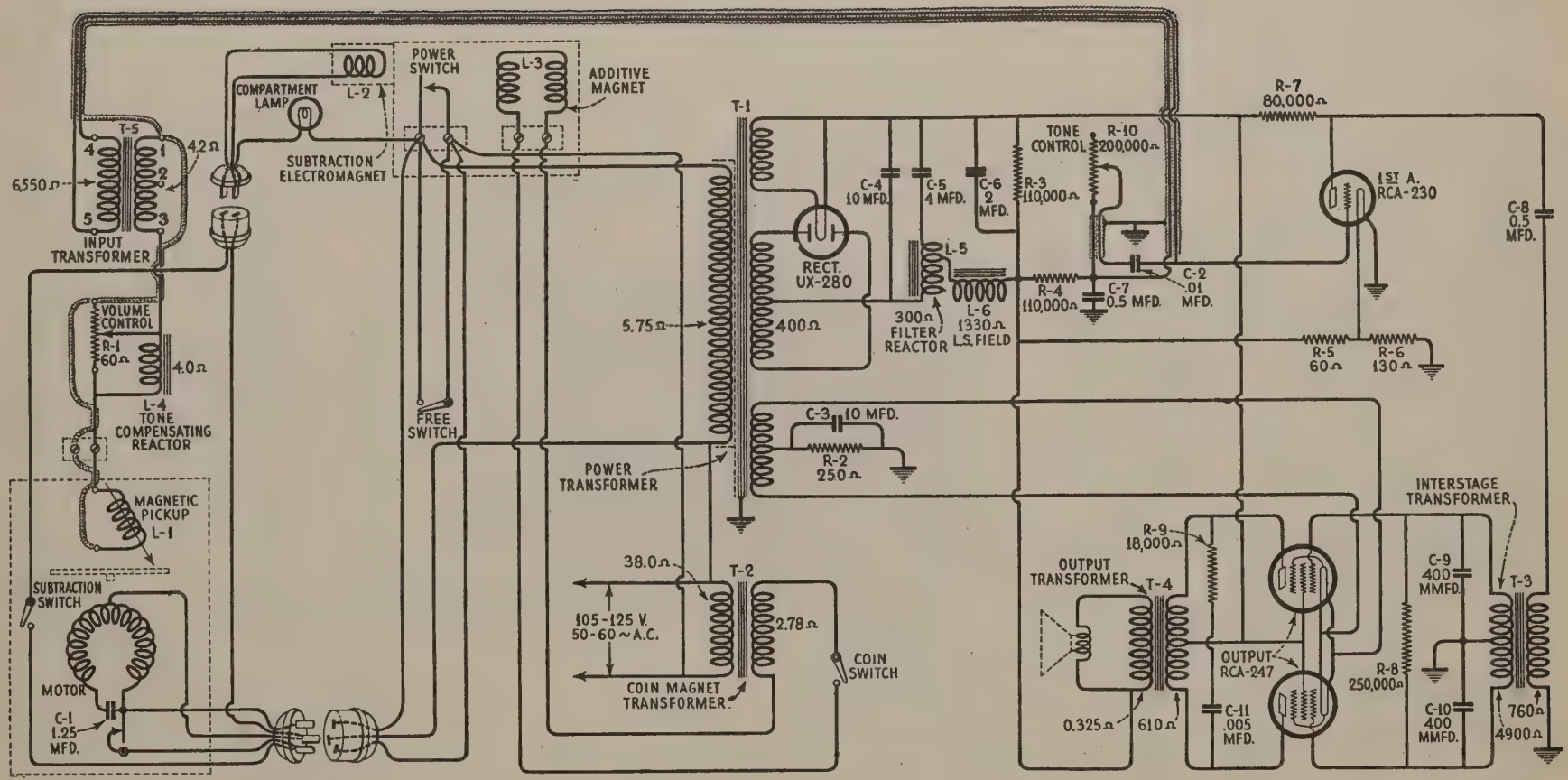


Figure 1—Schematic Circuit

SERVICE NOTES

for

RCA Victor Model CE-29

(Coin Operated Automatic Electrola)

ELECTRICAL SPECIFICATIONS

Voltage Rating	105–125 Volts
Frequency Rating	25, 50 and 60 Cycles
Power Consumption	130 Watts
Type of Circuit	Two Stage Audio Amplifier (Push-Pull Power Stage)
Type and Number of Radiotrons	One RCA-230, Two RCA-247, One UX-280—Total 4
Type of Magnetic Pickup and Tone Arm	Low Impedance Pickup with Inertia Type Tone Arm
Type of Record Changer	RCA Victor Continuous Type, Playing One Side of Ten 10-inch Records and Repeating Indefinitely
Turntable Speed	78 or 33⅓ R. P. M.
Type of Phonograph Motor	Induction, Operating at Synchronous Speed
Turntable Diameter	8 Inches
Type of Rectifier	Full Wave, UX-280
Type of Loudspeaker	Dynamic
Wattage Dissipation in Loudspeaker Field	10 Watts
Undistorted Output	4.0 Watts
Capacity of Coin Box	Approximately 300 Coins—Maximum of 23 May Be Inserted at Once

PHYSICAL SPECIFICATIONS

Height	46½ Inches
Depth	19⅝ Inches
Width	28⅜ Inches
Weight Packed for Shipment	200 Pounds

The RCA Victor Coin Operated Automatic Electrola Model CE-29 consists of a standard RCA Victor automatic record changing mechanism that holds ten 10-inch records, a two stage audio amplifier using Radiotrons RCA-247 as a push-pull output amplifier, a coin box with the necessary switches for controlling operation, an eight-inch dynamic type loudspeaker and a continuously variable tone control. Due to the large area of the cabinet, excellent low frequency reproduction is obtained.

The following description covers the technical features of the equipment. Refer to the Schematic Diagram, Figure 1.

The output of the magnetic pickup is connected directly across the volume control potentiometer. The arm and one side of the potentiometer are connected to the primary of the input transformer. It should be noted that a reactor is connected across the unused portion of the volume control. The The purpose of this reactor is to increase the volume of the lower frequencies—from 400 cycles down —at low volume. This compensates for the lesser sensitivity of the ear for low frequencies at low volume.

The secondary of the input transformer is connected to the grid circuit of the first stage audio amplifier, Radiotron RCA-230. The filament of this Radiotron is heated by rectified and filtered current from the UX-280. The reason for using this tube instead of the usual heater type tube is due to the thermal inertia of the latter type. Although the UX-226 would be suitable in this respect, its filament must be heated from A. C. and this would produce excessive hum.

The power stage consists of two Radiotrons RCA-247 connected in push-pull. A 200,000 ohm variable resistor connected in series with a 0.01 mfd. capacitor across the secondary of the input transformer provides a continuously variable tone control. Transformer coupling is used between the two stages as well as between the output stage and loudspeaker.

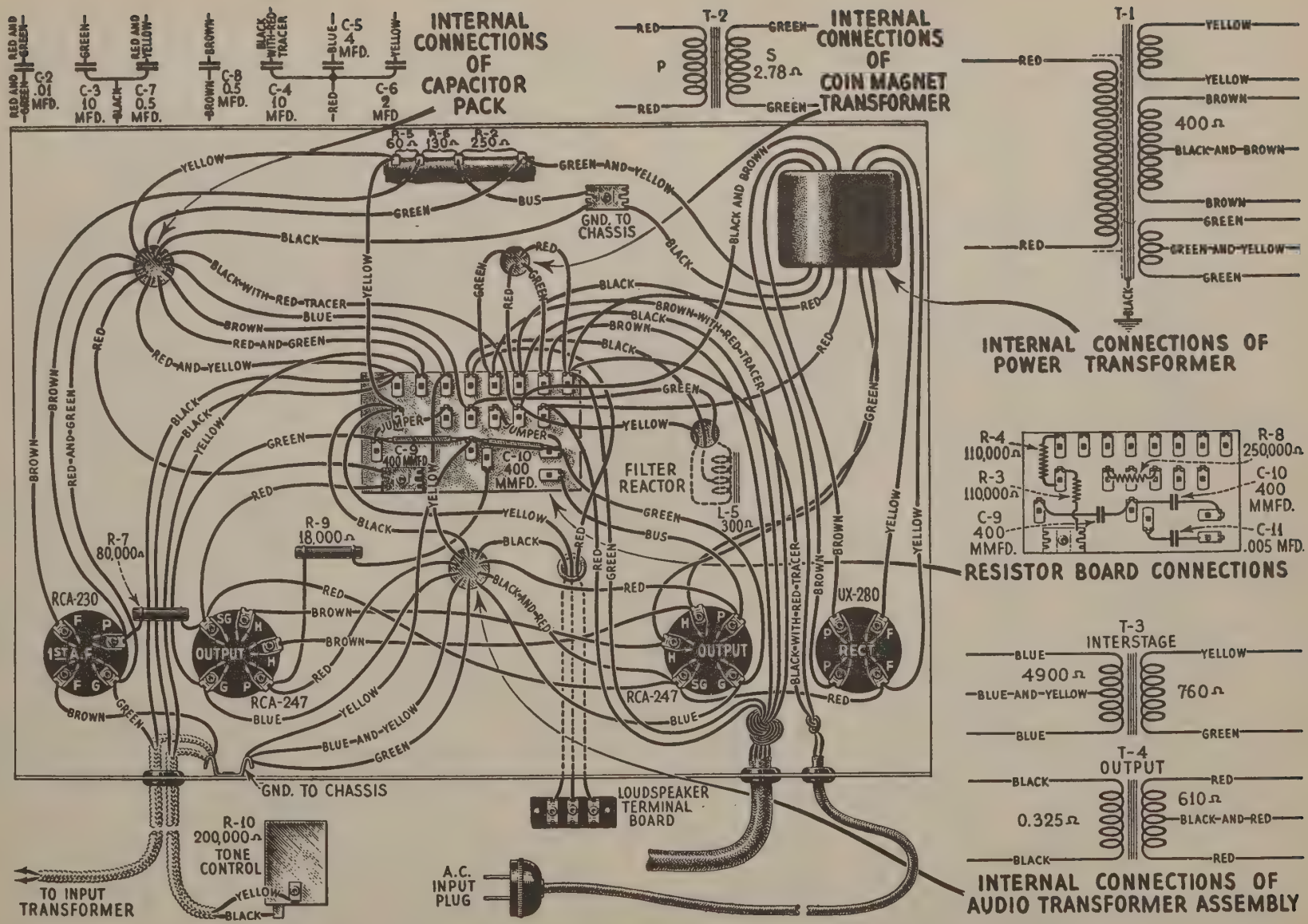


Figure 2—Amplifier Wiring Diagram

The Radiotron UX-280 provides a means of rectifying the high voltage output of the transformer which after suitable filtering is used as plate and grid supply for all Radiotrons and filament supply for the RCA-230.

Figure 3 shows a detail view of the coin mechanism with its adjacent schematic wiring. A detailed explanation of its functioning follows.

A coin inserted in the coin slot makes a momentary contact of the coin switch and thereby energizes the additive magnet. This magnet is energized by a small transformer, having a 16 volt secondary winding, the primary being permanently connected across the line.

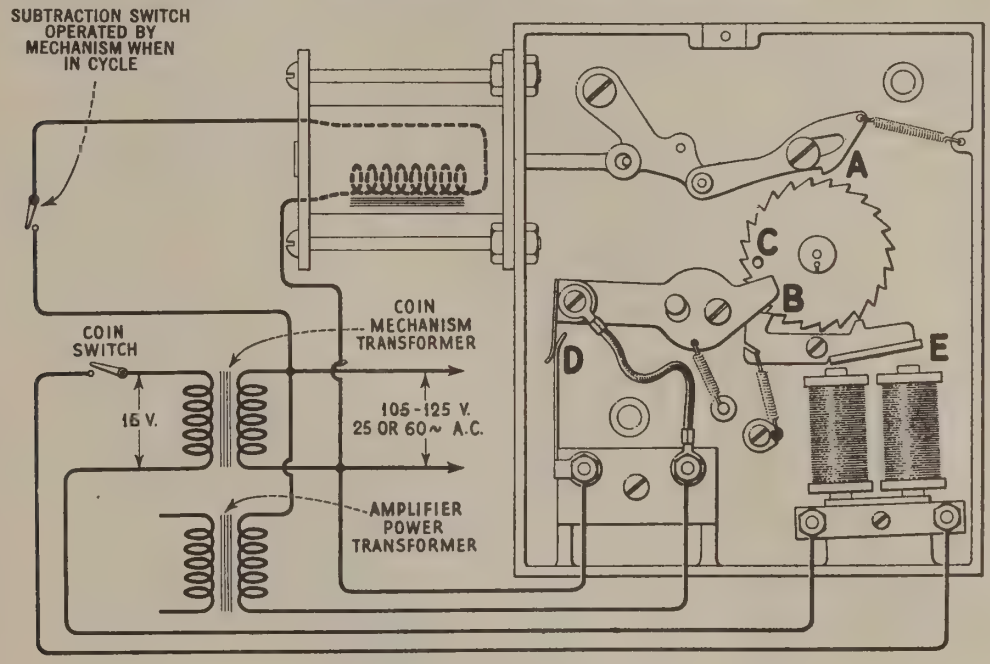


Figure 3—Coin Box Wiring

The energizing of the magnet pulls the lever "E" to the magnet and releases it after momentary contact of the coin switch. This closes the contact "D" by releasing the pressure on the contact arm by the pin "C." Also the lever "E" moves the ratchet due to its contact at "B." The ratchet will therefore move one notch for each nickel placed in the slot up to 23 nickels, it having only 23 teeth. As the contact "D" closes the power to the amplifier and turntable as soon as one nickel is inserted in the slot, the machine begins operation.

Upon completing one record the subtraction switch closes momentarily and energizes the solonoid which pulls lever "A" sufficiently to move the ratchet back one notch. If only one nickel has been inserted, the pin "C" will engage the contact lever and open the switch "D." However if more than one nickel has been inserted, the machine must go through an equal number of cycles before the pin "C" will engage the contact arm and open the circuit.

SERVICE DATA

Service work in conjunction with Model CE-29 will be similar to that of the usual amplifier and will consist of the location and replacement of parts that may prove defective. The amplifier wiring is shown in Figure 2, the assembly wiring in Figure 4 and the voltage readings and Replacement Parts on the following pages.

RADIOTRON SOCKET VOLTAGES

120 VOLT A. C. LINE

Radiotron No.	Control Grid to Filament Volts, D. C.	Screen Grid to Filament Volts, D. C.	Plate to Filament Volts, D. C.	Plate Current M. A.	Screen Current M. A.	Filament Volts
RCA-230	**2.0	—	80	2.0	—	*2.0 D. C.
RCA-247	17	270	250	30	6.0	2.6 A. C.
RCA-247	17	270	250	30	6.0	2.6 A. C.

*The filament voltage of the RCA-230 may vary considerably due to variations in filament resistance. The current however should be very close to 60 M. A. Measuring the current will give a much more accurate indication of correct operation than measuring voltage.
**This actual voltage is 4.5. Different resistance meters will give varying readings, the above value being approximate.

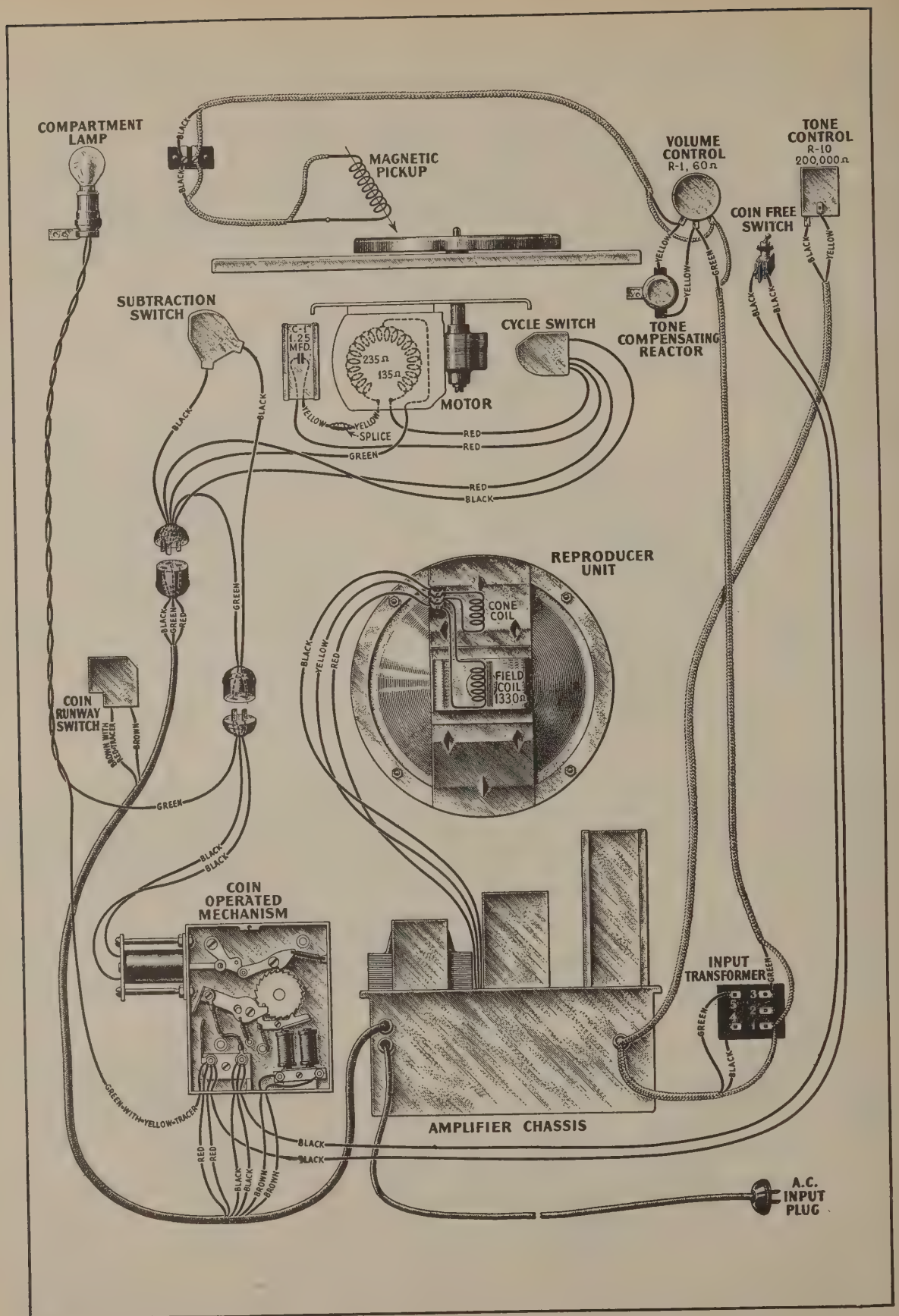


Figure 4—Assembly Wiring Diagram

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
	LOUDSPEAKER ASSEMBLY	
3237	Speaker mounting screw assembly—Comprising 4 screws, 8 nuts, 8 washers and 4 eyelets—Package of 1 set	$0.50
8559	Ring—Cone retaining ring	.80
8601	Cone—Speaker paper cone—Package of 5	15.00
8639	Coil—Speaker field coil assembly—Comprising field coil, magnet and cone support	5.00
	AMPLIFIER ASSEMBLY	
2857	Plug—Polarity 3 prong male connector plug	.70
2882	Socket—Five contact Radiotron socket complete with insulator	.50
2968	Socket—Four contact Radiotron socket complete with insulator—For Radiotron UX-280	.50
3032	Socket—Four contact Radiotron socket complete with insulator—For Radiotron RCA-230	.50
3085	Capacitor—400 mmfd	.60
3099	Capacitor—0.005 mfd	.75
3173	Plug—3 prong polarity female connector plug	1.30
3295	Resistor—110,000 ohms—Carbon type—½ watt—Package of 5	2.50
3296	Resistor—250,000 ohms—Carbon type—½ watt—Package of 5	2.50
3297	Resistor—80,000 ohms—Carbon type—½ watt—Package of 5	2.50
7054	Cord—Power cord	1.00
7270	Reactor	4.00
7458	Resistor—Flat type—440 ohms—Tapped at 60, 130, and 250 ohms—Complete with mounting rivets	1.10
7459	Board—Resistor board complete less resistors and capacitors	1.00
7460	Cable—13½" green and black shielded cable—From input transformer to amplifier	.50
7461	Cable—52½" yellow and black shielded cable—From tone control to amplifier	.50
7462	Control—Tone control complete with mounting nut and washer	1.90
8899	Transformer—Relay transformer	3.40
8900	Transformer—Power transformer	9.00
8901	Transformer—Interstage and output audio transformer in metal container	6.00
8902	Capacitor pack—Comprising two 10.0 mfd., one 4.0 mfd., one 2.0 mfd., two 0.5 mfd. and one 0.01 mfd. capacitors in metal container	8.50
8903	Cable—From amplifier to coin operated mechanism, coin runway switch and automatic mechanism	3.00
	AUTOMATIC RECORD CHANGING MECHANISM	
2614	Switch—Motor switch	1.40
2620	Cushions—Pickup rubber cushions—Comprising two pivots and one damper cushions—Package of 5 sets	1.25
2767	Spring—Pickup magnet retaining spring—Package of 10	.50
2768	Armature—Pickup armature	.50
2769	Coil—Pickup coil	.50
2770	Plate—Pickup damper plate—Package of 5	.50
2771	Screw—Pickup damper plate mounting screw—Package of 10	.50
2893	Spring—Trip lever spring—Package of 10	.60
2896	Spring—Cable lever spring—Package of 10	$0.50
2897	Screw and nut—Pickup arm cable adjusting screw and nut—Package of 5	.50
2898	Screw and nut—Adjusting screw and lock nut for elevator shaft—Package of 10	.50
2900	Screw—Adjusting screw for magazine lever—No. 3210—Package of 10	.50
2902	Screw and nut—Motor turntable spindle screw and nut—Package of 10	.50
2903	Screw—Motor mounting screw—Package of 10	.50
2904	Lever—Front elevator actuating lever	.50
2905	Screw—Gear and bracket mounting screw—Package of 10	.50
2906	Spring—Check lever spring—Package of 10	.50
2907	Screw—Clutch set screw—Package of 10	.50
2908	Spring—Clutch pawl spring—Package of 10	.50
2909	Spring—Four finger lever spring—⅜" long—Package of 10	.60
2910	Spring—Four finger lever spring 1⅛" long—Package of 10	.60
2911	Screw—Slide bracket screw—Package of 10	.50
2912	Roller—Slide roller complete with screw stud—Package of 5	1.50
2913	Spring—Cable lever spring—Package of 10	.60
2914	Spring—Flat spring with screws—Package of 10	.50
2915	Spring—Locating lever spring—Package of 10	.50
2916	Plate—Latch plate with mounting screws—Package of 5	.60
2917	Washer—Spring washer—Package of 10	.50
2918	Spring—Index lever spring—Package of 10	.50
2919	Screw and nut—Stop screw and nut—Package of 10	.50
2920	Washer—Friction washer—Package of 10	.50
2929	Lever—Rear elevator actuating lever—Package of 2	.50
3052	Screw assembly—Pickup pole shoe mounting screw, nut and washer—Package of 10 sets	.50
3159	Friction brake—Gear reducing friction brake spring and pad with mounting rivet—Package of 4	2.00
3161	Spring — Shift lever spring — Package of 5	1.20
3167	Magnet—Pickup magnet	2.60
3169	Pole shoe—Pickup pole shoe—R. H.	1.45
3170	Pole shoe—Pickup pole shoe—L. H.	1.45
3198	Bushing—Insulator rubber bushing—Package of 10	.50
3200	Shaft—Front or rear elevator shaft	.80
3204	Cable—Pickup arm cable—Package of 5	1.50
3209	Lever—Trip lever	1.10
3210	Lever—Magazine lever	.65
3211	Washer — Turntable spindle leather washer—Package of 10	.50
3212	Spring — Turntable spindle plunger spring—Package of 10	.50
3214	Pulley—Cable pulley with mounting stud—Package of 5	.50
3217	Lever—Check lever	.50

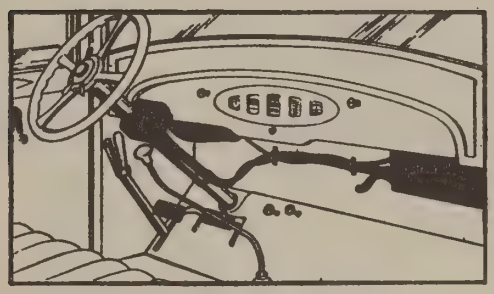
REPLACEMENT PARTS—(Continued)

Stock No.	DESCRIPTION	List Price
3280	Washer—Metal washer located underneath gear reducing unit—Package of 20	$0.50
3303	Post—Roller post assembly for supporting record magazine	.80
3305	Screw—Pickup arm base mounting screw and nut—Package of 10	.50
3306	Lever—Record transfer lever with screw and nut	1.70
3307	Screw and nut—Record transfer lever mounting screw and nut—Package of 10	.50
3308	Escutcheon—Turntable speed escutcheon plate with mounting rivets—Package of 2	.60
3309	Screw—Bottom plate mounting screw—Package of 10	.70
3310	Screw—Magazine bearing mounting screw and nut—Package of 10	.60
3311	Screw — Elevator mounting screw — Package of 10	.50
3312	Screw—Pickup needle holder screw—Package of 10	.60
3313	Cover—Pickup cover	.60
3314	Screw—Pickup cover mounting screw—Package of 10	.60
3315	Screw assembly — Pickup mounting screw, nut and washer—Package of 10	.60
3316	Bolt—Motor board mounting bolt—Package of 8	1.50
3317	Screw and nut—Record transfer lever adjusting screw and nut—Package of 10	.50
3318	Screw and nut—Pickup arm height adjusting screw and lock nut—Package of 10	.50
3319	Washer—Metal washer located underneath record magazine—Package of 20	.60
3320	Lever—Coin box kick-off operating switch lever with mounting rivet	.50
3321	Spring—Coin box kick-off operating switch lever spring—Package of 10	.60
3322	Switch—Coin box kick-off operating switch—Complete with fibre insulator and mounting screws	1.40
6115	Pawl—Clutch pawl	1.25
6116	Ratchet—Gear and ratchet complete with set screw	.90
7151	Back—Pickup back housing	.50
7186	Gear—Gear and bracket	1.40
7188	Bracket—Slide bracket with roller	.75
7189	Lever—Front and rear elevator cam lever—Package of 5	2.20
7190	Lever—Locating lever	.85
7191	Lever—Cable lever	.60
7192	Cam—Cam gear and cam	1.50
7194	Rotor and shaft—60 cycles	8.00
7305	Gear reducing unit complete	4.50
7318	Spindle and gear—Turntable spindle with gear—60 cycles	5.00
7321	Lever—Cable guide lever with pulley	.90
7374	Cover—Turntable covering	.50
7393	Block and wire—Pickup connector block and wire	.90
7470	Rear elevator	1.00
7471	Front elevator	.80
7472	Lever—Manual index lever	1.10
7473	Bearing—Magazine bearing—Located on motor board	1.00
7474	Bearing—Pickup arm base bearing—Located on motor board	1.00
7475	Pickup—Pickup unit complete	12.50
7476	Lever—Speed reducing shift lever	$0.80
8644	Capacitor—Motor capacitor—1.25 mfd.	1.40
8646	Slide—Main slide	2.20
8647	Lever—Four finger lever	1.20
8755	Motor—Motor complete—60 cycles	33.50
8906	Arm — Pickup arm complete — Less pickup	5.50
8907	Magazine—Record magazine	4.10
8908	Board—Motor board assembled with speed reducing lever, lever spring elevator bushings and speed escutcheon plate	12.50
8909	Turntable—Turntable with cover	7.80
	MISCELLANEOUS PARTS	
3137	Knob—Volume or tone control knob—Package of 5	3.25
3184	Board — Magnetic pickup terminal board complete with 2 terminals and terminal screws	.50
3266	Bracket—Compartment lamp socket mounting bracket—Package of 5	.50
3267	Bushing—Bakelite lamp socket cord bushing—Package of 10	.50
3298	Switch—Power switch—Toggle type—Single pole, single throw—Complete with mounting nuts and washer	1.60
3299	Magnet—Coin slide magnet	.50
3300	Switch—Coin operated switch	1.20
3301	Key—Glass door key—Package of 2	.50
3302	Lock—Coin box lock and key	2.50
3304	Box—Needle box with lid—Package of 2	.70
6226	Transformer—Input transformer	3.75
7387	Reactor—Tone compensating reactor with mounting bracket	.85
7463	Shielded cord—42″ green shielded wire—From input transformer to volume control	.50
7464	Shielded cord—38″ black shielded wire—From pickup terminal board to volume control	.50
7465	Control—Volume control complete with mounting nut and washer	1.90
7466	Cord—54″ twisted lamp socket conductor cord	.60
7467	Coin slide assembly—Comprising coin slide, slide frame, escutcheon and magnet	6.10
7468	Coin runway and switch assembly—Comprising coin runway and coin operated switch	6.30
7469	Receptacle—Tungstone needle receptacle	.60
8904	Coin mechanism—Coin operated mechanism box complete	32.20
8905	Box—Coin box for nickels	.80
10371	Socket—Compartment lamp socket	1.40
	CABINET PARTS (Prices Furnished On Application)	
X-93	Post—Front post—R. H.	
X-94	Post—Back post—R. H.	
X-95	Post—Front post—L. H.	
X-96	Post—Back post—L. H.	
X-97	Foot	
X-98	Panel—Drop panel with glass	
X-99	Back—Loose back—Assembled	
X-100	Baffle board and grille cloth	
3323	Hinge assembly—Drop panel hinge assembly—Comprising R. H. and L. H. hinge with mounting screws	
3324	Pull—Drop panel pull with mounting screw and washer	
3325	Lock—Drop panel lock	

S. O. 9113 1M 441-32

RCA Victor
Automobile Radiola M-30

INSTALLATION AND SERVICE NOTES



First Edition—10M
Copyright January, 1932

SERVICE DIVISION

RCA Victor Company, Inc.

Camden, N.J.

A RADIO CORPORATION OF AMERICA SUBSIDIARY

Property of the RCA Victor Company, Inc. ***Confidential and to be used only by its Authorized Distributors and Dealers in furnishing service in connection with its apparatus.***

Copyright 1932—RCA Victor Company, Inc.

CONTENTS

INTRODUCTION

Page

Introduction 5
Receiver Assembly 5
Control Box 6
Loudspeaker 6
Battery Box 6
Antenna Plate 6
Ignition Equipment 7

PART I—INSTALLATION

Location and Mounting of Units 7
Receiver Unit 7
Loudspeaker 9
Control Unit 9
Flexible Shaft 9
Antenna Plate 10
"B" Batteries 10
Ignition Equipment 11
Connections 11
Installation of Roof Antenna 13
Installations on Model "A" Fords 14

PART II—SUPPRESSION OF IGNITION INTERFERENCE

Ignition Adjustments on Motor 15
By-pass Capacitors 15
Ignition Coil 15
Antenna Plate 15
Cables 17

PART III—SERVICE DATA

Electrical Description of Circuit 17
Radio Frequency and Oscillator Adjustments 18
Intermediate Frequency Adjustments 19
Voltage Readings 20
Testing Capacitors 21
Checking Resistance Values 21
Wiring Diagrams 21
Volume Control 23

PART IV—REPLACEMENT PARTS

Numerical List of Replacement Parts 24

PART V—INSTALLATION DATA ON INDIVIDUAL CARS

Installation Data 27

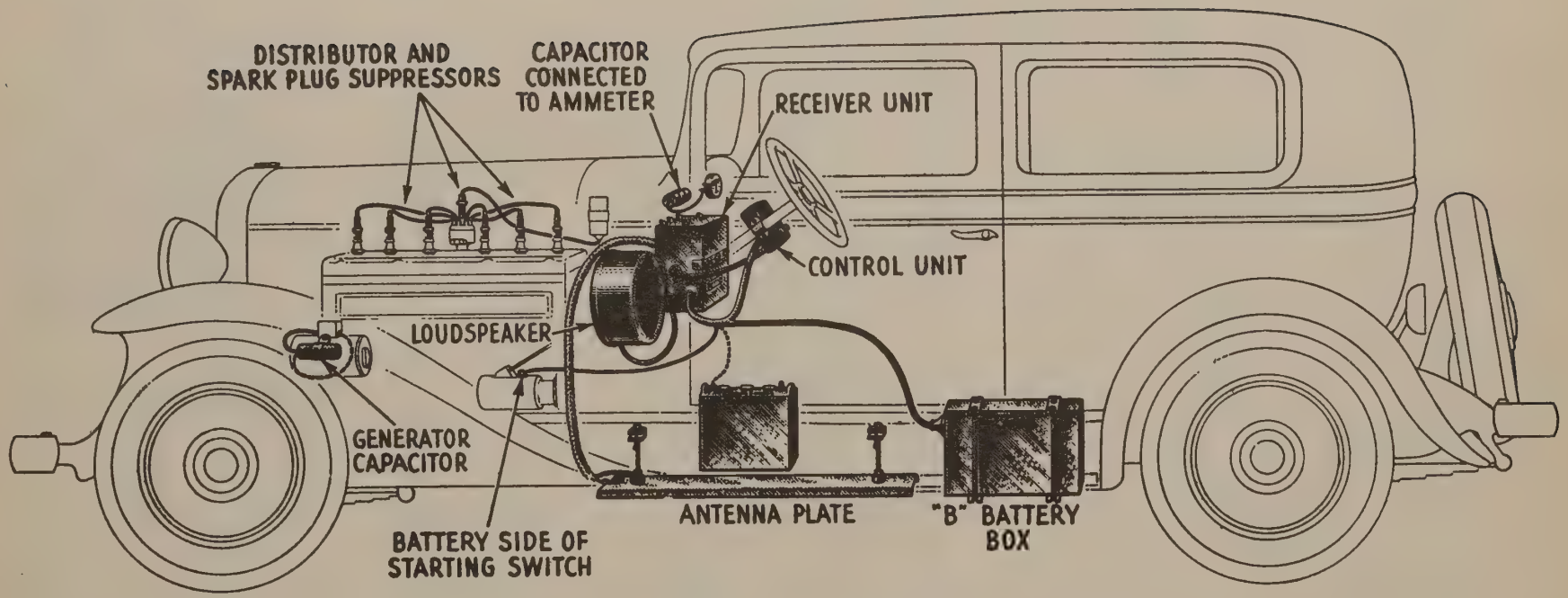
ILLUSTRATIONS

Page

General View 4
Receiver Assembly 5
Control Box 6
Loudspeaker 6
Battery Box 6
Antenna Plate 6
Ignition Equipment 7
Various Locations of Units 8
Details of Receiver Mounting 8
Radiotron Location 9
Wiring Change 9
Control Box Adjustment 10
Typical Location of Antenna Plate and Battery Box 10

Page

Battery Box Connections 11
Typical Installation of Suppressors 11
Grounding Antenna Shields 12
Cable Connections for Batteries 12
Details of Roof Antenna 13
Location of Units in Model "A" Ford 14
Alternative Position for Speaker on Model A Ford .. 14
Bracket Dimensions 14
Schematic Diagram 16
Suppressor Installations 17
Location of Adjusting Screws 19
Control Box Wiring 21
Wiring Diagram 22
Cable Wiring 23



General View of Typical Installation of Automobile Radio

SERVICE AND INSTALLATION NOTES

for

RCA Victor Automobile Radiola Model M-30

INTRODUCTION

The RCA Victor Automobile Radiola, Model M-30, is a nine tube Super-Heterodyne radio receiver designed for automobile or motor boat use. Features of this receiver are; sensitivity and selectivity equal to that of high quality home receivers, high output Class B amplifier giving a large undistorted output with a small plate battery drain, permanent magnet dynamic loudspeaker requiring no external field supply, automatic volume control using entirely new principles of operation and extremely low battery consumption for both heater and plate supply. This feature allows the use of the automobile battery as "A" supply without imposing an additional load upon it that cannot be readily compensated for by a slight generator charging readjustment. The low plate current drain allows excellent "B" battery life. Use of the new automobile type Radiotrons eliminates the possibility of Radiotron failure due to vibration or varying heater voltage such as is encountered in automobile driving.

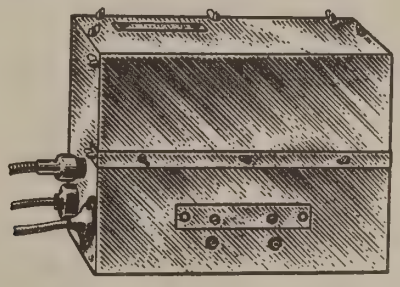


Figure 1—Receiver Assembly

In the design of this receiver, special attention has been given to the ease with which the installation may be made, and the elimination of interference originating in the ignition system. Thorough shielding of all parts together with proper design of the receiver makes it possible to reduce ignition interference to a negligible degree. This is done without any sacrifice in the sensitivity of the receiver.

A description of the various units follows.

RECEIVER ASSEMBLY

The receiver assembly, Figure 1, is housed in a metal case that acts as an effective mechanical and electrical shield. A bracket is provided for mounting so that dismounting is a comparatively simple operation, requiring the removal of but one screw.

The top section of this container is fastened by means of wing nuts. This provides for easy removal for checking or replacing Radiotrons. The battery and control box cable, the loudspeaker cable and the flexible tuning cable are all held in place by means of fittings which allow their easy removal in case the box is to be removed from its mounting. The case is finished in a dull smooth black that is not easily scratched and harmonizes with the usual car finishes.

CONTROL BOX

The control box, Figure 2, contains the station selector knob, the dial scale, the volume control and the key switch. It is provided with a felt strip and mounting clamp for attaching to the steering column of the car. The dial scale is marked in channels (multiply by 10 for kilocycles) and is of the non-glare type. The switch is provided with a key, which when removed, locks the radio at the "off" position.

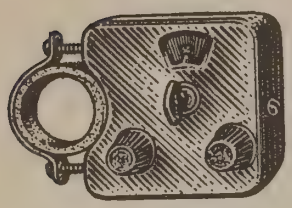


Figure 2—Control Box

Figure 3—Loudspeaker

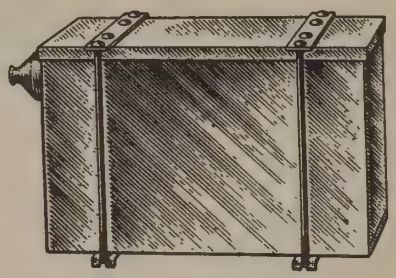


Figure 4—Battery Box

LOUDSPEAKER

The loudspeaker, Figure 3, used in the automobile equipment is of the permanent magnet, dynamic type. It is housed in a smooth black finished metal container which also acts as an effective baffle. Due to the presence of the strong magnetic field, even when the set is turned off, special provision has been made to prevent metallic substances from being drawn into the air gap of the speaker and thereby cause rattles. The speaker edge and center is entirely closed, thus preventing such entry from the front. A fine gauze covering is placed over the back, thus eliminating any such matter from entering from that side. The cord outlet is provided with a rubber bushing that closes up its opening. The speaker has excellent frequency characteristics and is of extremely rugged construction.

BATTERY BOX

A special heavy steel battery box, Figure 4, is furnished as optional equipment when it is either undesirable or impossible to install the batteries behind or under the seats or in the rear compartment of the car. This box is so constructed that the batteries may be mounted and connected therein and then lifted into position beneath the car. Four carriage bolts, each provided with two lock nuts, hold it in place.

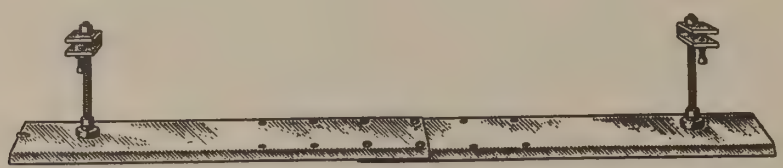


Figure 5—Antenna Plate

ANTENNA PLATE

The antenna plate, Figure 5, is provided for use when a roof antenna is not already installed in the car. It is provided with special bolts and clamps that allow easy mounting to the frame of the car. Due to the high sensitivity of this receiver, satisfactory results may be obtained with the undercar antenna except in districts where the signal intensity of all stations is extremely low. In such cases a roof antenna must be erected in accordance with the instructions given in Part I, Section 3.

IGNITION EQUIPMENT

Six spark plug type suppressors, one distributor type suppressor and two 0.75 mfd. capacitors, Figure 6, are provided for the suppression of ignition interference so that it does not materially affect radio reception. The details of installing this equipment are covered in Part I and varies somewhat in different cars.

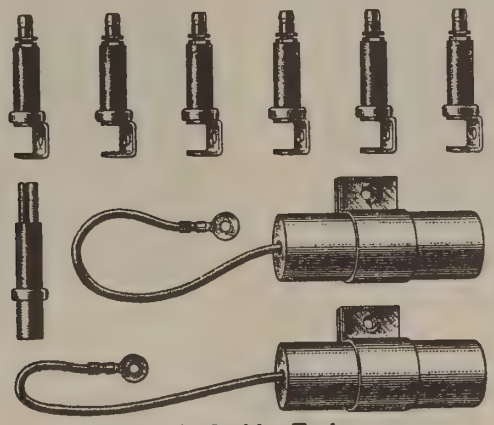


Figure 6—Ignition Equipment

PART I—INSTALLATION

Due to the nature of the installation it is advisable that the RCA Victor Automobile Radiola be installed by a competent radio service man in conjunction with an automobile mechanic. The usual automobile repair shop has the necessary tools and lifts that are desirable in making the installation. If it is necessary to erect a roof antenna, this work must be done by a competent "trim" shop working under direction of the service man. However, after making several installations the service man may feel confident enough to attempt all the installation work himself, with the exception of the roof antenna. For such work the following list of equipment is provided which will be found useful when performing such work.

1 Pair Gas Pliers
1 Pair Diagonal Pliers
1 Pair Long Nose Pliers
1 Small Crescent Wrench
1 No. 4 Spintite Wrench
1 Thin Shank 6" Screw Driver
1 Small Screw Driver
1 Large Screw Driver
1 Pair Tin Shears
1 Heavy Duty Soldering Iron
1 Medium Soldering Iron
Supply of Rosin Core Solder
Supply of Acid Core Solder
Supply of ½" Belden Braid
Supply of Sheet Copper
1 Electric Drill with Set of Drills Up to ½"
1 Set Seat and Door Protectors
1 Reamer—¾" maximum
1 Set Analyzer or Miscellaneous Voltmeters

(1) LOCATION AND MOUNTING OF UNITS

The proper method of installing the equipment of the RCA Victor Automobile Radiola is covered in the Installation Instructions packed with each equipment. However, as there are many different types of installations, this information will be repeated together with a discussion of its numerous variations.

RECEIVER UNIT

Location The usual location for the receiver unit is on the right side of the engine compartment bulkhead directly under the dash. Figure 7 shows a typical installation. In some cars this will have to be on the opposite side directly over the steering column, Figure 8. It is important that the space selected have at least four inches clearance directly over the receiver, otherwise it cannot be removed from the mounting bracket. Interference with other equipment under the dash, and

interference of the mounting bolts with equipment on the engine side of the bulkhead must be avoided. Figure 8A shows an installation where the receiver is in the usual location, but the loudspeaker is in the center.

Figure 7— Usual Location of Receiver

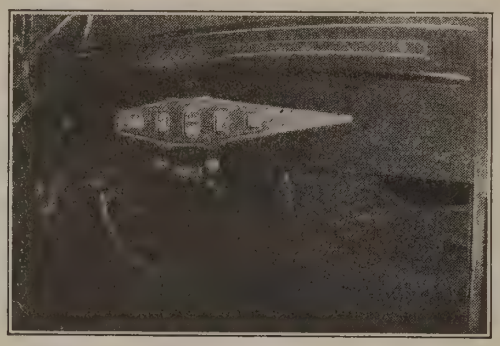


Figure 8—Receiver Over Steering Column

In some cars, the ignition coil is on the compartment side of the bulkhead or under the dash. If there is a choice of places available, the one at the greatest distance from the coil should be chosen. This is important as it reduces the ignition noise considerably.

Mounting Using the card inside of the Receiver Carton as a template, determine the proper location on the bulkhead and mark the location of the three holes with a center punch. A space at least four inches high must be left above the receiver. Extra holes are provided in the bracket to be used in case the regular holes are not satisfactory. If the bulkhead is curved, the template must be used flat and not follow the contour of the curved surface. In some cases, the receiver unit bracket must be mounted away from the bulkhead to clear obstructions. The center punch must be held perpendicular to the template when marking the holes to insure proper alignment. Next drill three 7/16 inch holes as marked. Then attach the bracket to the bulkhead by means of nuts and lockwashers furnished as shown in Figure 9.

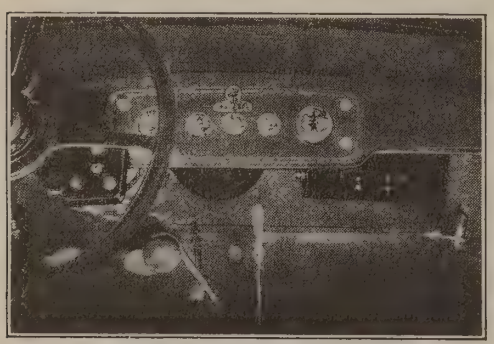


Figure 8A—Receiver on Right with Loudspeaker in Center

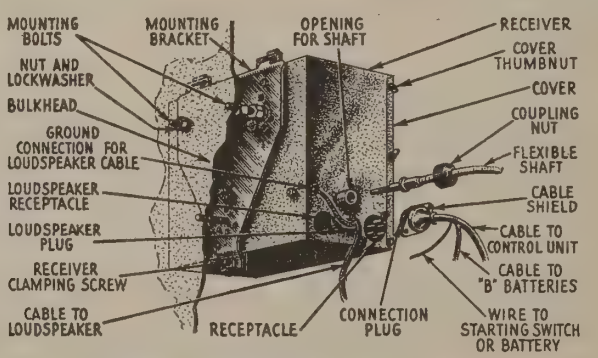


Figure 9—Details of Receiver Mounting

Remove the thumb-nuts from the top, front and sides of the receiver. Remove the packing material from around the Radiotrons and make certain that they are in the proper sockets. (See Figure 10).

Press the grid contact caps firmly over the contacts on top of all RCA-236 Radiotrons. Also make sure that the tuning capacitor rotor plates are fully meshed with the stator plates so that the flexible shaft may be easily mounted. If the positive terminal of the storage battery is grounded to the frame of the car, it will be necessary to remove the bottom of the receiver and change the yellow and blue wire from its normal position on the resistor board to that indicated by the dotted line in Figure 11. Replace the bottom, the cover and thumb-nuts making sure the nuts are tight. Hang the receiver on the bracket hooks, insert the clamp screw and washer at the bottom and tighten with a screw driver.

LOUDSPEAKER

Location The Loudspeaker may be mounted at several locations, in most automobiles. However, the preferable location is on the bulkhead facing the rear of the car and on the opposite side from that of the receiver. If several locations are available, choose the one that gives the best acoustical results. This can easily be determined by experiment by not mounting the speaker until the rest of the equipment is in place and the receiver operating.

Mounting The instructions for mounting the receiver assembly apply equally well to the loud speaker, with the exception that the loudspeaker is mounted direct, there being no bracket provided. A template is also provided for this unit. No clearance space above the loudspeaker is required.

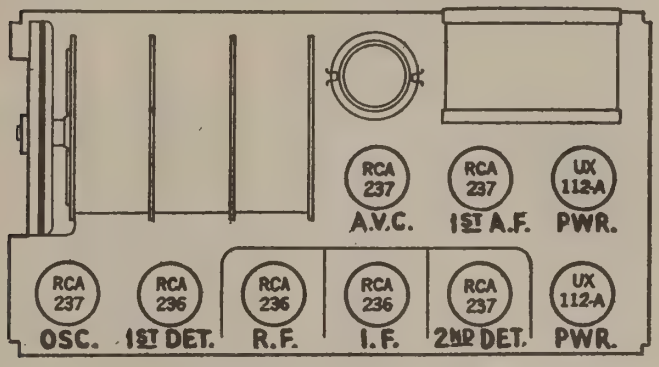


Figure 10—Radiotron Socket Location

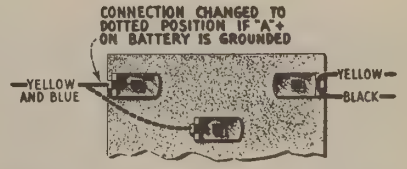


Figure 11—Wiring Change for Cars Having Positive Side of "A" Battery Grounded

CONTROL UNIT

Location The control unit is mounted on the steering column at a convenient height for the driver. Due to the large size of the steering wheel hub on some cars, this distance must be adjusted for best visibility.

Mounting Place the felt around the steering column and hold it in place by means of string or a piece of tape. Remove one screw from the clamp and place the box and clamp around the felt. Replace the screw that was removed and tighten both screws equally.

FLEXIBLE SHAFT

Location The flexible shaft is used to mechanically connect the tuning capacitor in the receiver assembly to the drive and dial in the control box. It should be placed and fastened to the car so that it connects these two points together and is clear of any foot room or instruments. On some cars a special length shaft will be required. Such flexible shafts are listed in Part IV, page 24.

Mounting Turn the Station Selector until the flat side of the shaft may be seen through the hole in the side of the unit. Insert the end of the shaft into the opening at the rear of the Control Unit making certain that it engages the end of the shaft inside of the latter. Turn the shaft until the set screw is visible and tighten the set screw against the flat side of the shaft. Thread the coupling nut of the shaft onto the Control unit.

Turn the Station Selector knob clockwise so that the dial is at the extreme counter-clockwise position. Then insert the free end of the shaft into the opening provided on the receiver, turning the Station Selector knob back and forth until the shaft meshes. Tighten the collar that holds the shaft to the receiver unit.

After completing these two operations, slowly turn the Station Selector knob to the extreme clockwise and then to the extreme counter-clockwise position. Normally, this will insure the use of the complete range of the dial. If, however, it is noticed that a slight amount of tension is present at either end of the dial, then the control unit must be turned on the steering column in the direction of the tension, while making this adjustment. Then returning it to its normal position will relieve this additional tension. Figure 12 gives the details of this latter adjustment.

ANTENNA PLATE

Location The antenna plate, if used, should be mounted under the car and as far to the rear as possible. Also it must be as low (close to the road) as possible and still maintain the clearance of the lowest point of the car from the road.

Usually, it is mounted on the opposite side from the Muffler and exhaust pipe to prevent crowding. See Figure 13. In some cases, it is desirable to mount the plate crosswise to the car chassis. Avoid any location that will place the plate in a position that will impede the free motion of the chassis parts such as springs, drive shaft, or axles, as damage to the antenna will result.

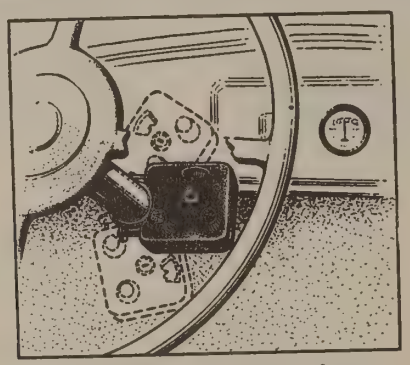


Figure 12—Position for Control Box in Order to Make Adjustments

Mounting After determining the proper location, fasten the plates together with the screws provided. Adjust the length so that the plate is as long as possible and still fulfill the foregoing conditions. Assemble the mounting bolts onto the plate as shown in Figure 5 and fasten the clamps to the car frame. Then tighten the bolt that holds the antenna plate to the bracket and the screw and lock nut that holds the bracket to the car frame. *Too much attention to the proper tightening of these screws is impossible, as any loosening of this plate that results in one end dropping while the car is driven at high speed may result in an accident.*

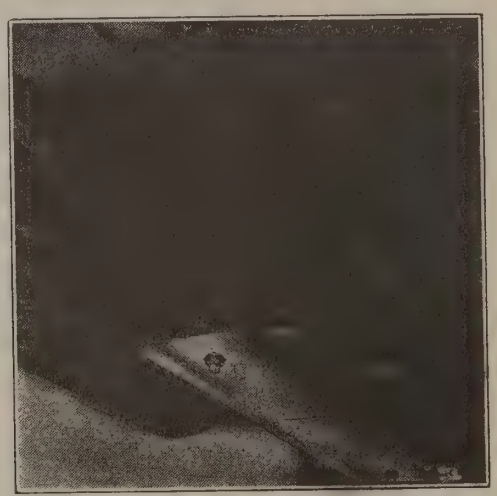


Figure 13—Typical Location of Antenna Plate and Battery Box

"B" BATTERIES

Location If possible, the "B" batteries should be mounted under one of the seats or behind the back of the rear seat. In cars having a rear compartment or trunk, the batteries may be located therein.

However, if such a place is not possible, then a battery box must be used. This box can usually be mounted under the car by fastening to the floor boards. Its location should be as far from the muffler and exhaust pipe as possible, as the heat from these parts will have a detrimental effect on the life of the batteries.

Mounting Using the cover of the battery box as a template, locate the cover on the floor boards under the car and mark the boards for the center of the four mounting bolts. Drill four 3/8" holes in the floor boards. Insert the four carriage bolts in the holes from the top. Make sure the hanger bolts are in place in the cover and fasten the cover to the four bolts in the floor board. In the case of cars having metal floor boards, machine screws with spacers must be used instead of carriage bolts. Make sure that the mounting bolts do not project too far down into the box so that they will fail to clear the batteries.

After fastening the top securely in place, place the "B" batteries in the box and connect them to the receptacle as shown in Figure 14. Slip the cambric cover over the fuse and place the paper strips and plate over the terminals. Then lift the box into place, swing the hanger bolts into place and tighten both nuts securely. Care should be taken to draw up on all four nuts gradually.

For mounting both the antenna plate and the battery box, it is desirable to place the car on a "lift."

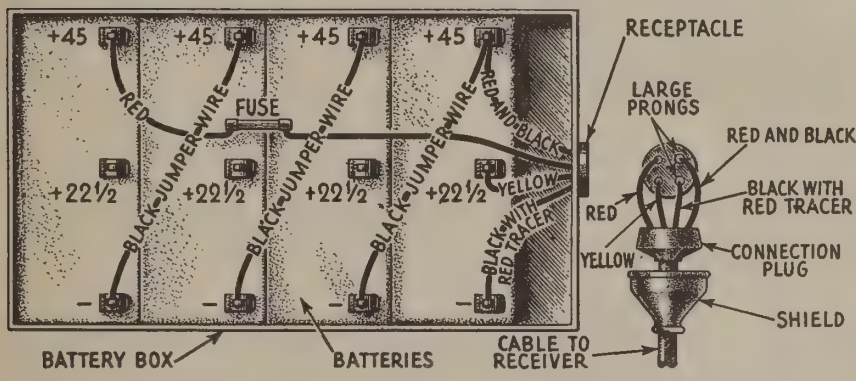


Figure 14—Battery Box Connections

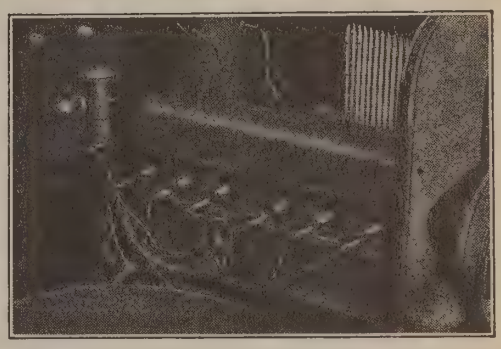


Figure 14A—Typical Installation of Suppressors

IGNITION EQUIPMENT

Two .75 mfd. capacitors, six spark plug type suppressors and one distributor type suppressor are furnished to be installed in the car's ignition system so that its R.F. radiation may be reduced to a point so as not to interfere with radio reception.

One .75 mfd. capacitor is connected across the output of the generator. Remove a screw from the generator frame, usually the one holding the cut-out, insert the screw through the hole in the capacitor clamp and replace the screw. Connect the lead from the end of the capacitor to the terminal on the generator side of the cut-out switch.

The other capacitor is connected from the battery side of the ammeter to the car frame. Usually, one of the screws on the underside of the dash can be used to hold the capacitor, thereby making the ground connection. Then connect the lead to the ammeter terminal.

The spark plug type suppressors are inserted in series with each high tension lead at its point of connection to the plug. The distributor suppressor is inserted in series with the high tension lead from the coil at its point of connection to the distributor.

There are a number of variations in the installation of this ignition suppression equipment that are covered in Part II.

(2) CONNECTIONS

Loudspeaker to Receiver Insert the plug on the end of the loudspeaker cable into the two-contact receptacle on the end of the receiver. Fasten the pigtail under the self-tapping screw as shown in Figure 9.

Main Cable to Receiver A long cable, from the control unit and battery box, is attached to the receiver by means of a six point female plug. Insert the plug into the receptacle on the receiver. A metal cap is fitted over two studs at the same time. Fasten the nuts over these studs securely.

Main Cables to Batteries Drill ½" hole in the toe boards directly below the end of the receiver unit to which connections are made. (If any holes that may be used for this purpose are already available, drilling additional holes is unnecessary). Pass the free end of the cable through the hole and thence to the "B" Battery location. Possibly other holes must also be drilled. Connect the "B" batteries to the cable as shown in Figure 15. The metal braid must be pushed back from the free end and taped so that sufficient length leads are obtained for connecting the batteries. If the battery box is used, solder the four prong plug onto the end of the cable as shown in Figure 14.

The cable should be fastened to the chassis of the car by means of the clamps or staples provided. Take up any slack by making a loop and tape securely.

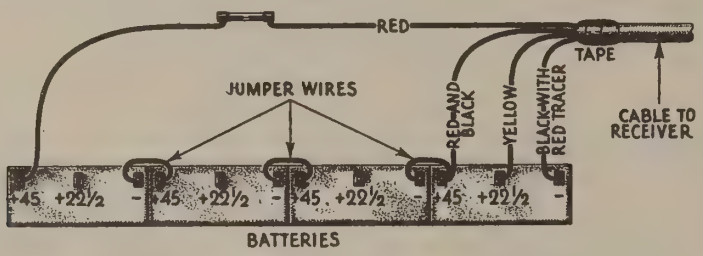


Figure 15—Cable Connections to "B" Batteries.

Receiver to Antenna The antenna lead should follow the shortest practical path between the receiver and the antenna. It is very desirable to avoid passing it through the engine compartment or close to the ignition coil, if mounted on the dash or compartment side of bulkhead.

If a roof antenna is used, cut the lead from the antenna as short as possible and still allow length for connection. Then cut the antenna lead and shield from the receiver to a proper length, allowing about two inches extra on the shield so that it may be slit and braided into a pigtail. Solder and tape the connections securely. Then solder the frayed part of the pigtail and either fasten or solder it securely to the car frame. The pigtail should be as short as possible and a good electrical joint made to the car frame.

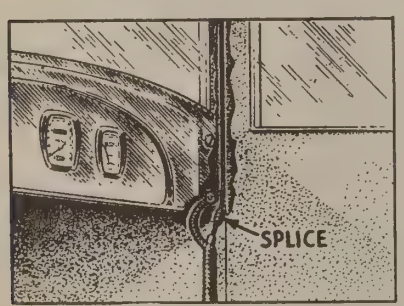


Figure 16—Proper Method of Grounding Shield When Using Roof Antenna

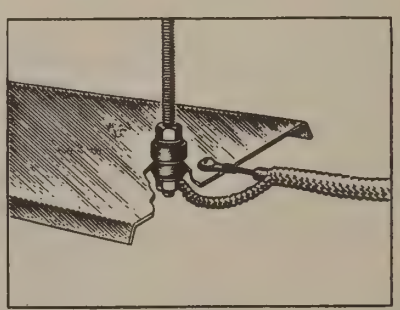


Figure 17—Proper Method of Grounding Shield When Using Plate Antenna

If the antenna plate is used, the antenna lead and shield should be cut in the same manner as for the top antenna, except that the pigtail must be slightly longer. An eyelet terminal is provided for soldering to the end of the antenna lead so that it may be held by the screw and nut at the end of the antenna plate. The pigtail should be fastened under one of the nuts that hold the plate to its mounting bolts. Figures 16 and 17 illustrate the correct manner in making both types of connections.

Receiver to "A" Battery One side of the "A" Battery connection is made through the frame of the car. The "hot" side is made by means of a single lead that is brought out from the main cable. This lead is provided with a lug that should be fastened under the nut that holds the battery connection to the starting motor switch.

This completes the installation. All cables should be fastened securely to the car so that interference with its operation is avoided. This is especially true of those under the dash which may

interfere with the driver's foot room. The switch may then be turned "on" and the receiver operated in the usual manner. Normally, starting the car engine will not introduce any objectionable noise. However, if ignition interference is present that is objectionable, then a reference to Part II will give the details for clearing up this trouble.

(3) INSTALLATION OF ROOF ANTENNA

In cars not already equipped with roof antennae, the usual installation is that of the antenna plate. Due to the high sensitivity of this receiver, entirely satisfactory results are obtained from the plate antenna in most installations. However, if the car is to be operated in a locality remote from any stations and having a general low degree of signal strength, the erection of a roof antenna is advisable. The following details cover the procedure to be used in a majority of closed cars. This work should be done by a competent "trim" man as a degree of skill, only acquired by experience, is necessary in removing and replacing the fabric top of a car.

The antenna should be composed of copper screen having a total area of at least 10 square feet. It should be located as far to the rear as possible and insulated from any metal part of the car which may ground it. In some cars having a metal rib in the center, it will be advisable to make the antenna in two pieces and use insulated wire as straps for bonding it together. All joints together with the lead-in connections should be well soldered.

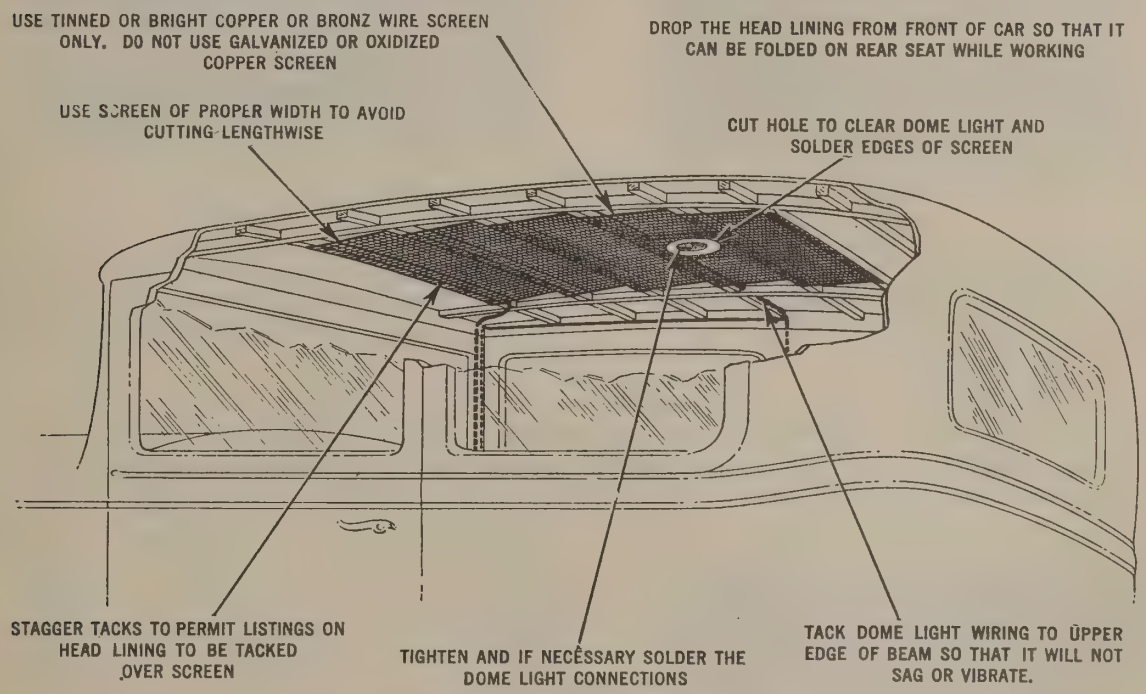

USE TINNED OR BRIGHT COPPER OR BRONZ WIRE SCREEN ONLY. DO NOT USE GALVANIZED OR OXIDIZED COPPER SCREEN
DROP THE HEAD LINING FROM FRONT OF CAR SO THAT IT CAN BE FOLDED ON REAR SEAT WHILE WORKING
USE SCREEN OF PROPER WIDTH TO AVOID CUTTING LENGTHWISE
CUT HOLE TO CLEAR DOME LIGHT AND SOLDER EDGES OF SCREEN
STAGGER TACKS TO PERMIT LISTINGS ON HEAD LINING TO BE TACKED OVER SCREEN
TIGHTEN AND IF NECESSARY SOLDER THE DOME LIGHT CONNECTIONS
TACK DOME LIGHT WIRING TO UPPER EDGE OF BEAM SO THAT IT WILL NOT SAG OR VIBRATE.

Figure 18—Details of Roof Antenna

1. First determine if there is a grounded metal screen in the roof of the car, as some cars use such a screen for the top material support. A sharp pointed instrument, connected on one side of a continuity tester, the other side being grounded, should be used. Push the point through the top lining and fish around until it comes in contact with the wire screen. If any reading is obtained, even though very small, the screen is grounded and it cannot be used for an antenna. If not, however, one corner of the head lining may be removed and a connection soldered to the screen which will make an excellent antenna.
2. If the screen is grounded or if no screen is present, it will be necessary to remove the head lining and a strip clipped from the screen several inches from all edges and from the dome light or insert a copper screen approximately of these same dimensions. If there is a possibility of the screen shifting, tack it to one of the ribs and lace the sides with cord.
3. Solder a length of shielded wire to the right front corner of the screen. Then solder or bond the shield securely to the car frame. The lead-in is then run down the right front roof

support. Usually, this can follow the path of the dome light lines. It should be noted however, that if the ignition coil is mounted on either side of the dash, it is preferable to run the lead-in down the column further from the coil.

4. Again test the antenna from the set end of the lead-in to ground for any possible shorts. If none exist then replace the head lining. Figure 18 shows a typical roof antenna installation.

(4) INSTALLATIONS ON MODEL A FORDS

The Model A Ford presents a somewhat involved problem for the installation of the RCA Victor Automobile Radiola. The reason for this is that due to the gasoline tank being part of the cowl, the usual location for the set and speaker cannot be used. Two positions for the receiver and three for the speaker are possible, each having several disadvantages.

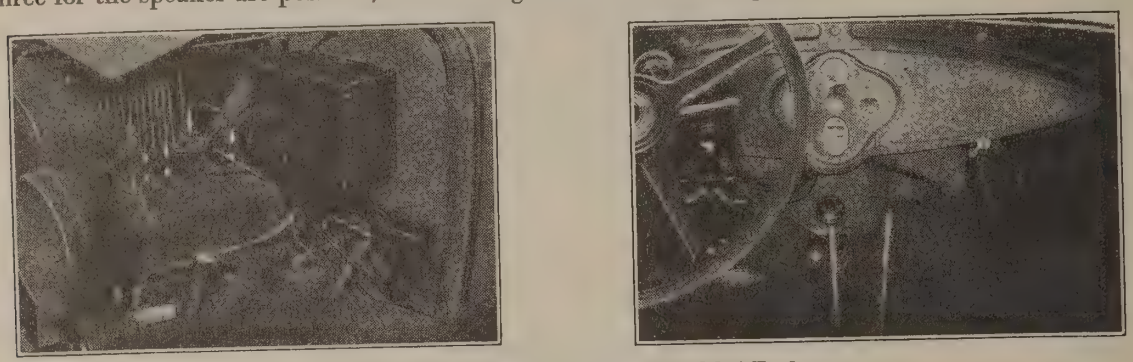


Figure 19—Location of Units in Model A Ford

The receiver unit may be mounted in the engine compartment as shown in Figure 19, more easily than at any other location. The disadvantage of this position is that due to the high noise level present even when suppressors are used, a satisfactory installation cannot always be made. The receiver is also subject to motor fumes, water and steam used in engine cleaning and the usual atmospheric conditions.

The other alternative position for the receiver is on the right side of the driving compartment as shown in Figure 20. The dimensions for a template to be mounted to the body to hold the receiver or loudspeaker are shown in Figure 21. The interference may be successfully eliminated at this location but the position of the receiver interferes with the leg room of the person riding beside the driver.

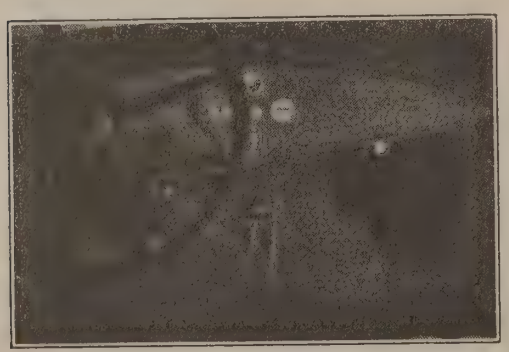


Figure 20—Alternative Position for Receiver and Loudspeaker

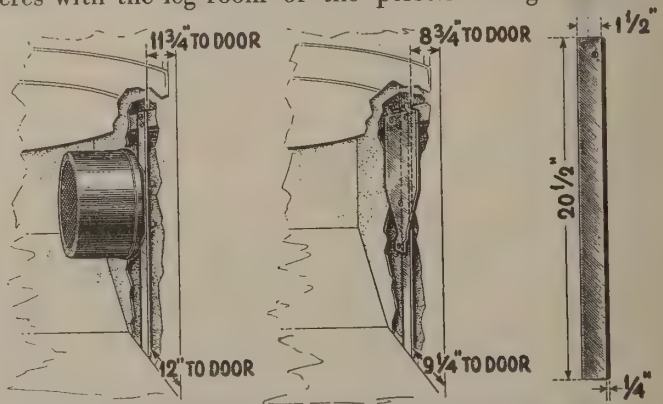


Figure 21—Dimensions of Bracket for Mounting Receiver or Loudspeaker to Side of Driver's Compartment

The loudspeaker may be mounted at either side of the car, using the same template for a bracket as that shown in Figure 21, on models not having pockets at either of these locations. On such models, such as the roadster, the loudspeaker can be mounted directly behind the gear shift lever and bolted to the seat base. This location is not seriously in the way and gives good acoustical results.

The batteries may be mounted behind the rear seat in the sedan models, in the rear compartment of coupes and roadsters or in a battery box on any model.

PART II—SUPPRESSION OF IGNITION INTERFERENCE

In general, the use of the ignition suppressors and capacitors as described in Part I of this booklet will reduce the ignition interference to a negligible amount. However, on some installations it will be found that the noise is still present to a degree that is undesirable. In such cases, the following hints will aid the installation man in clearing up this trouble.

(1) IGNITION ADJUSTMENTS ON MOTOR

The first step in clearing up a noisy installation is to thoroughly check and remedy any defects in the ignition system of the car. By this we mean the spark plugs should be cleaned and adjusted or replaced, the breaker points replaced or adjusted and synchronized if necessary, the distributor arm filled out with solder until it makes a full even contact, and the generator commutator cleaned and its brushes adjusted or replaced. Also all wiring should be cleaned and loose connections or poor joints remedied. This work is the first step in the clean-up job and it should be done by a competent ignition expert, who has been acquainted with the need of accurately making all adjustments.

Usually, such adjustments though made on a motor that is performing efficiently, will materially reduce the ignition noise in the radio receiver.

(2) BY-PASS CAPACITORS

In some installations a re-arrangement of the connections of the by-pass capacitors will be found beneficial. For example, the by-pass capacitor connected to the battery side of the ammeter, if connected to the battery side of the ignition coil may be more effective.

In other cases using an additional capacitor at the coil, a total of three for the installation, will remedy the trouble. In all cases the generator capacitor is used, although if a clicking is heard when the cut-out makes and breaks its circuit, the pigtail should be connected to the load side rather than the generator side of the cut-out relay.

On some cars, two capacitors—one on each terminal—at the ammeter will greatly reduce the noise. This is especially true of 1932 Studebakers.

(3) IGNITION COIL

The car ignition coil, due to the high electromagnetic field surrounding it, should be at as great a distance as possible from the receiver, preferably on the opposite side of the metal bulkhead. On cars that have the ignition coil mounted on the instrument board directly over the receiver unit, it may be necessary to place it in the engine compartment. Where the switch is mounted into one end of the coil, the switch assembly must be removed from the coil and a bracket provided for mounting it. The leads from the coil should be shielded and the shield grounded. (Use Packard High Tension Cable for the high tension lead to the distributor).

Another important point is that of the primary connections. While not affecting the ignition system in its relation to the car, due to the use of auto-transformers as coils, interchanging the primary leads to a coil will sometimes materially reduce the ignition noise.

(4) ANTENNA PLATE

If grounding the antenna at its point of exit from the shield reduces or eliminates the noise, then it is feeding in through the antenna. The remedy in such a case is to place the antenna further toward the rear of the car. Also lowering it, slightly will greatly increase its signal pickup. Care must be exercised when doing this, to ascertain that the road clearance of the car is not reduced. Another important point to check is the grounding of the outer end of the antenna shield. Grounding this end of the shield to the chassis in practically all cases, materially reduces ignition noise. However, in certain cases, grounding this shield may increase the noise. In such cases the shield should be insulated with tape and left ungrounded.

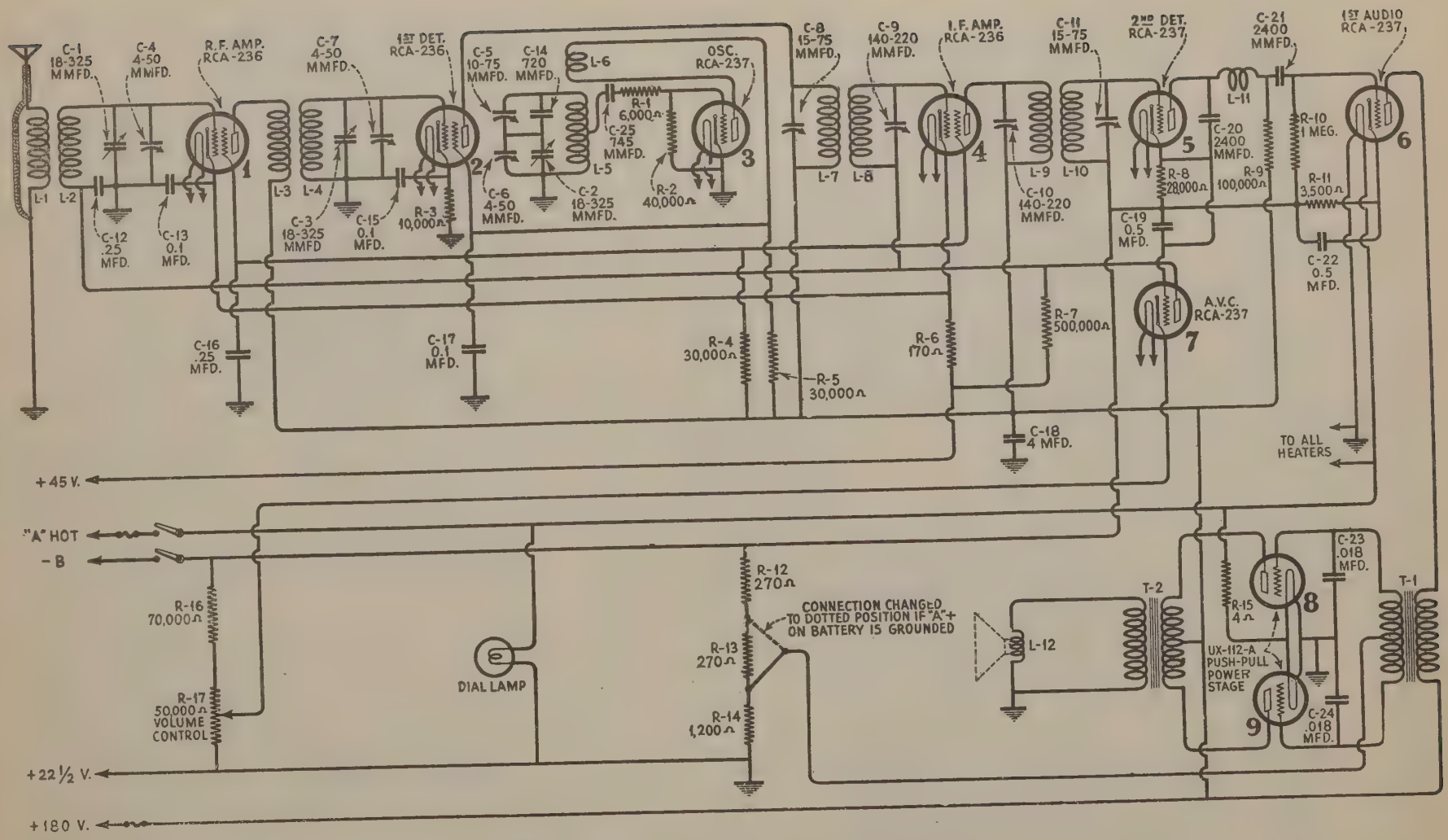


Figure 22—Schematic Wiring Diagram of Receiver Assembly

(5) CABLES

Proper placing of the various shielded cables may have a bearing on the ignition noise picked up as well as contact noise caused by a variable contact between the cable shields and the car frame.

The antenna lead should follow the shortest path between the receiver unit and the antenna. If there is any possibility of the shield rubbing against any of the car frame, the cable should be taped or clamped in place. The "B" battery cable should be taut and any slack taken up by means of a loop. It should also be fastened or taped securely.

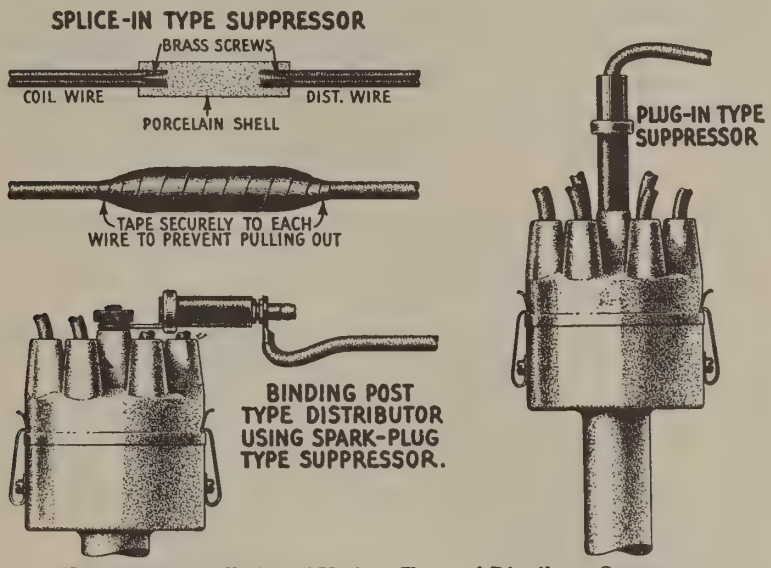


Figure 23—Installation of Various Types of Distributor Suppressors

(6) DISTRIBUTOR SUPPRESSORS

Three different styles of distributor suppressors are used, due to the variations in the distributor head connections. These are illustrated in Figure 23. The plug-in type is supplied with this equipment and is used in the majority of cars. The spark plug type with the end flattened is used in Packard and other cars having the binding post connection. The splice-in type is used on cars that do not have a readily removable connection to the distributor head. It is spliced into the high tension head, as close to the distributor as possible. This type may also be used on cars not having much room at the spark plugs, such as the Buick. While not furnished with regular equipment, the splice-in type suppressor is listed in Part IV.

PART III—SERVICE DATA

Service work in connection with the RCA Victor Automobile Radiola is very similar to that of the usual broadcast receiver. However, the following description of the circuit and method of making adjustments will be found helpful in locating and remedying any failure that may occur.

ELECTRICAL DESCRIPTION OF CIRCUIT

The following description of the circuit will give the service man a better understanding of the functioning of the receiver and thereby help him in his work. Figure 22 shows the schematic circuit diagram.

The first tube is the tuned R.F. stage. This is the screen Grid Radiotron, RCA-236. The control grid bias for this Radiotron is varied by means of the automatic volume control tube.

The output of the R. F. stage is coupled inductively to the grid coil of the first detector. At this point the oscillator output is also coupled inductively to the grid coil of the first detector.

This is a tuned grid circuit oscillator using a Radiotron RCA-237 and having a closely coupled plate coil that gives sufficient feed-back to provide stable operation. The grid circuit is so designed that by means of a correct combination of capacity and inductance a constant frequency difference between the oscillator and the tuned R. F. circuits throughout the tuning range of the receiver is obtained.

The next circuit to examine is the first detector. The circuit is tuned by means of one of the gang condensers to the frequency of the incoming signal. Radiotron RCA-236 is used in this stage. In the grid circuit is present the incoming signal and oscillator frequencies. The beat frequency —175 K.C.—appears in the plate circuit of the first detector which is accurately tuned to 175 K.C.

The next stage is that of the I.F. amplifier. A single stage is used, requiring two I.F. transformers, consisting of four tuned circuits. The plate circuit of the first detector, the grid and plate circuit of the I.F. amplifier and the grid circuit of the second detector are all tuned to 175 K.C. Radiotron RCA-236 is used in this stage and its control grid voltage is also varied by means of the automatic volume control tube.

At this point it is well to consider the action of the automatic volume control tube as it controls the R.F. and I.F. amplifiers of the receiver. The grid of the automatic volume control tube, RCA-237, is connected direct to the cathode of the second detector.

The change in the bias voltage of the second detector, due to fluctuation of the signal, is applied to the grid of the A. V. C. tube. This produces a voltage drop across a resistor in the plate circuit which constitutes the control grid bias for the R. F. and I. F. amplifier. As the value of the plate current is a direct result of the voltage applied to the grid, a greater plate current gives a greater voltage drop across the resistor in its plate circuit and therefore a higher bias on the I. F. and R. F. stage. This results in less sensitivity and vice versa. The volume control varies the bias on the grid of the volume control tube.

The second detector is of the grid-biased type, using Radiotron RCA-237. The purpose of the second detector is to extract the audio frequency component of the R.F. signal which represents the voice or musical modulations produced in the studio of the broadcasting station. The audio component is extracted and used to drive the first A.F. tubes while the R.F. current is by-passed and not further used.

The output of the second detector is coupled by means of resistance coupling to the grid of the first A. F. Radiotron RCA-237. This audio stage is used as a driver for the Class B amplifier.

The output of the first audio stage is coupled by means of transformer coupling to the grids of the Radiotrons UX-112-A used as a push-pull Class "B" power stage. This stage is so biased that normally no plate current flows. However, as the grid swings positive due to the signal voltage being applied, plate current flows which is entirely of an audio character. As there is little residual current when no signal is present, this is a very economical amplifier as well as providing a high undistorted output—2 Watts.

The entire "A" battery current drain is 2.85 Amperes and the "B" current 12 M.A. minimum and 25 M.A. average maximum.

Filament and heater current is supplied from the storage battery in the car. Plate current is supplied by means of four medium size "B" batteries. A fuse is provided in both filament and plate circuits to protect the batteries and tubes.

(1) R. F. AND OSCILLATOR ADJUSTMENTS

Four adjustable capacitors are provided for aligning the R. F. circuits and adjusting the oscillator frequency so that it will be at a 175 K. C. difference from the incoming R. F. signal throughout the tuning range of the set. Poor quality, insensitivity, and possible inoperation of the receiver may be caused by these capacitors being out of adjustment.

If the other adjustments have not been tampered with—the intermediate tuning capacitors—the following procedure may be used for adjusting these capacitors.

1. Loosen the receiver unit clamping screw and dismount the receiver from its mounting bracket. Do not remove any of the connections or the flexible cable.

2. Procure an R. F. oscillator giving a modulated signal at exactly 1400 K. C. and 600 K. C. Also procure a non-metallic screw driver—Stock No. 7065 — and a No. 5 Spintite socket wrench.

3. An output indicator is necessary. This should be a current-squared thermo-galvanometer substituted or connected in parallel to the loudspeaker leads.

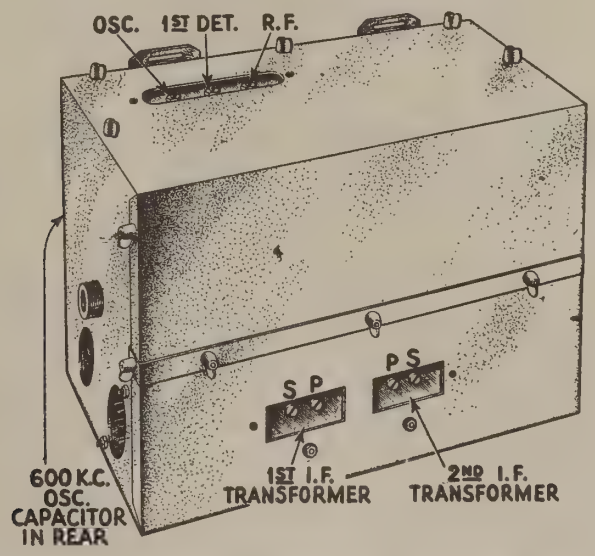


Figure 24—Location of Radio Frequency, Oscillator and Intermediate Frequency Adjustments

4. Remove the top cover of the receiver and remove the automatic volume control tube. Also ascertain that the tuning capacitor is fully meshed when the dial reads 150.

5. Place the oscillator in operation at exactly 1400 K. C. and couple it to the antenna. Set the dial at exactly 140 and adjust the coupling between the antenna and oscillator so that the output indicator does not give an excessive reading.

6. With the socket wrench, adjust the oscillator (see Figure 24), the first detector and the R. F. line-up capacitors until a maximum deflection is obtained in the output meter.

7. Set the oscillator at 600 K. C. Tune in this signal with the receiver and adjust for a deflection in the output meter. Now adjust the 600 K. C. series capacitor, Figure 24, until maximum output is obtained. Rock the tuning capacitor back and forth while making this adjustment.

8. Change the oscillator frequency to 1400 K. C. and set the dial at 140. Again make the adjustments given under 2, 3, 4, 5 and 6.

(2) I. F. TUNING CAPACITOR ADJUSTMENTS

A single intermediate frequency amplifier stage is used in this receiver. Two transformers are used and all circuits are tuned to 175 K. C. The circuits are peaked and when alignment adjustments are made, the capacitors are adjusted for maximum output. It will be necessary to remove the chassis from its mounting bracket as is the case of the R. F. adjustments.

A detailed procedure for making these adjustments follows:

a. Procure a modulated R. F. oscillator giving a signal at 175 K. C. The General Radio Type 360 is suitable. A non-metallic screw driver such as Stock No. 7065 is also necessary.

b. Connect an output meter in the circuit. A current-squared galvanometer connected either in place of or across the loudspeaker leads is suitable.

c. Remove the metal cover over the top of the receiver and then remove the oscillator and automatic volume control tube, Figure 10. Make a good ground connection between the receiver chassis and the car frame.

d. Place the oscillator in operation and connect its output between the control grid connection of the first detector and ground, see Figure 10.

e. Now adjust the secondary and primary of the second and first I. F. transformers until a maximum output is obtained in the output meter. Go through these adjustments a second time as a slight readjustment may be necessary. Be sure the output from the oscillator is not great enough to overload the first detector and I. F. tubes.

f. When the adjustments are made, the set should perform at maximum efficiency. However, due to the interlocking of adjustments, it is a good plan to always follow the I. F. adjustments with the R. F. and oscillator lineup capacitor adjustments as described in Part III, Section I.

(3) VOLTAGE READINGS AT RADIOTRON SOCKETS

The following voltages taken at each Radiotron socket with the receiver in operating condition should prove of value when checking with test sets such as the Weston Model 547, Type 3, or others giving similar readings. The plate currents shown are not necessarily accurate for each tube, as the cable in the test set will cause some circuits to oscillate, due to its added capacity. Small variations of voltages will be caused by different tubes. Therefore, the following values must be taken as approximately those that will be found under varying conditions. The numbers in column 1 indicate the tube socket numbers shown in Figure 26.

RADIOTRON SOCKET VOLTAGES

VOLUME CONTROL AT MINIMUM

Tube No.	Cathode to Heater Volts	Cathode or Filament to Control Grid Volts	Cathode to Screen Grid Volts	Cathode or Filament to Plate Volts	Plate Current M. A.	Screen Grid Current M. A.	Heater or Filament Volts
1. R. F.	18	0.5	100	136	0	0	6.0
2. 1st Det.	1.0	3.0	42	150	0.25	0.1	6.0
3. Osc.	6.0	0	—	45	3.5	—	6.0
4. I. F.	18	1.0	100	136	0	0	6.0
5. 2nd Det.	12	10	—	110	0.5	—	6.0
6. 1st A. F.	15	2.0	—	165	3.5	—	6.0
7. A. V. C.	10	1.0	—	15	0	—	6.0
8. P. W. R.	—	20	—	155	1.5	—	4.5
9. P. W. R.	—	20	—	155	1.5	—	4.5

VOLUME CONTROL AT MAXIMUM
(NO SIGNAL BEING RECEIVED)

1. R. F.	18	0.5	70	135	4.0	1.0	6.0
2. 1st Det.	1.0	3.0	42	150	0.25	0.1	6.0
3. Osc.	6.0	0	—	45	3.5	—	6.0
4. I. F.	18	0.5	70	135	4.0	1.0	6.0
5. 2nd Det.	12	10	—	110	0.5	—	6.0
6. 1st A. F.	15	2.0	—	165	3.5	—	6.0
7. A. V. C.	5.0	9.0	—	15	0	—	6.0
8. P. W. R.	—	20	—	155	1.5	—	4.5
9. P. W. R.	—	20	—	155	1.5	—	4.5

(4) TESTING CAPACITORS

The by-pass capacitors are in a metal container. The internal wiring diagram is shown in Figure 26.

The capacitors can best be tested by freeing their connections and charging them with approximately 180 volts D. C. (use the four "B" batteries) and then noting their ability to hold the charge. After charging, short circuiting the capacitor terminals with a screw driver should produce a flash the size of the flash depending on the capacity of the capacitor and the voltage used for charging. A capacitor that will not hold its charge is defective and requires replacement of the entire unit.

(5) CHECKING RESISTANCE VALUES

The values of the various resistance units in this receiver are shown in the schematic diagram, Figure 22. When testing a receiver for defects, the various values of resistance should be checked. This may be done by a resistance bridge; the voltmeter-ammeter method, or by the following method.

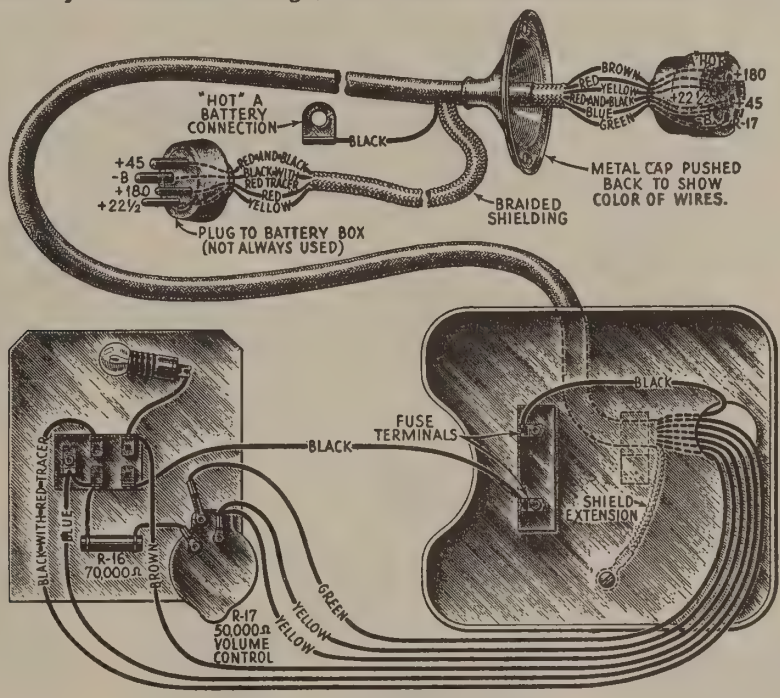


Figure 25—Control Box Wiring

For resistance of low value, 5000 ohms or less, use a voltmeter having a resistance not greater than 100 ohms per volt. For high values of resistance use a meter of 1000 ohms or more per volt. The Weston meters, Type 301 or 280, each have a resistance of 62 ohms per volt and are satisfactory for the low values. Use sufficient battery to give a good deflection on the meter, for example, a 45 volt "B" battery for a 0-50 voltmeter. Take two readings, one of the battery alone, and one of the battery with the unknown resistance in series. Then apply the following formula:

$$\left(\frac{\text{Reading obtained of battery alone}}{\text{Reading obtained with resistance in series}} - 1 \right) \text{Resistance of meter} = \text{Unknown Resistance}$$

(6) WIRING DIAGRAMS

The schematic wiring diagram is shown in Figure 22. The Control Unit wiring is shown in Figure 25 and the general wiring in Figure 26. A reference to these diagrams when locating trouble or replacing a unit will usually prove helpful. The internal connections of the cables are shown in Figure 27.

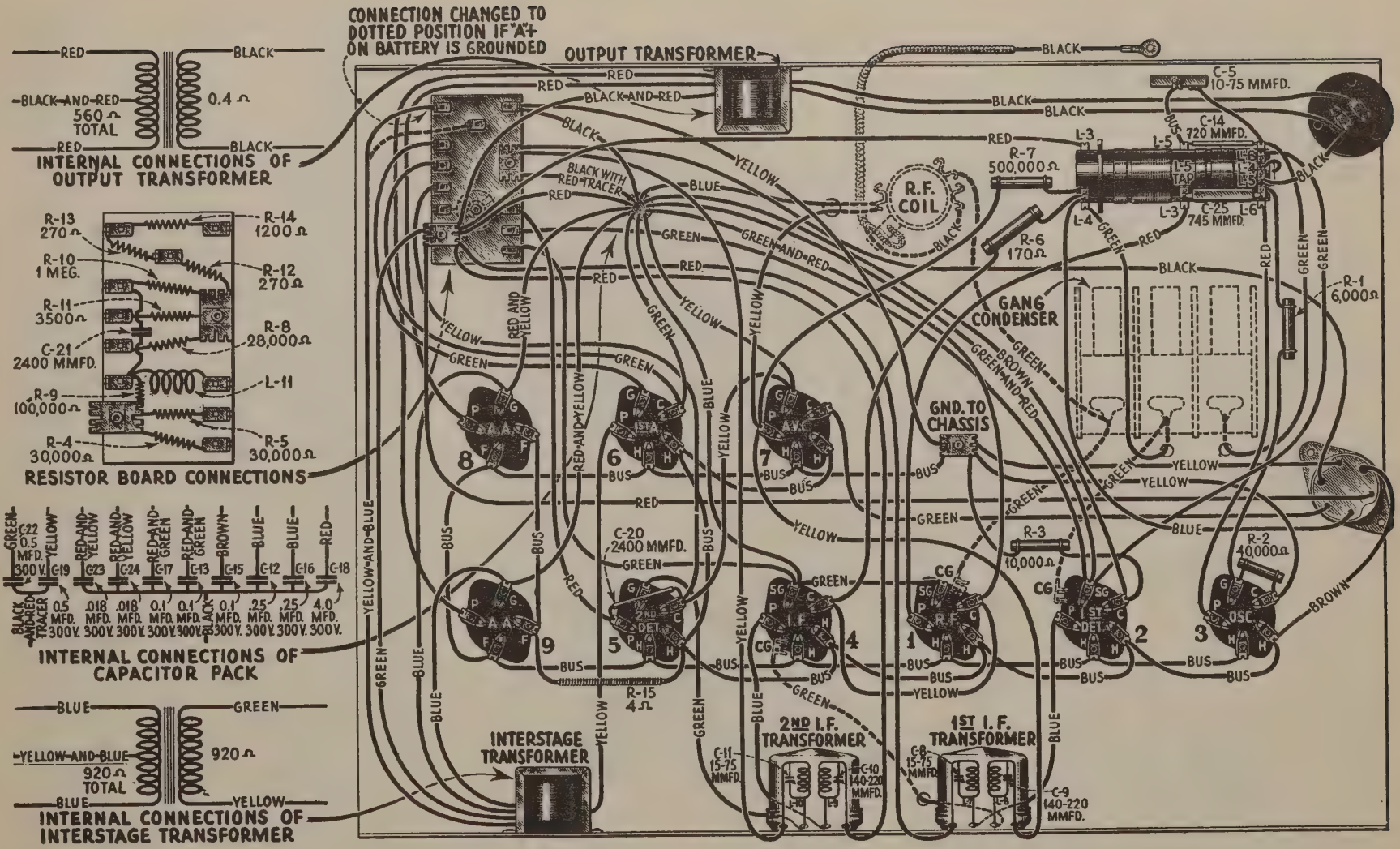


Figure 26—Wiring Diagram of Receiver Unit

(7) VOLUME CONTROL

Normally, turning the volume control to the extreme counter-clockwise position will reduce the output volume of the receiver to zero. However, in event a powerful local station does not reduce to a satisfactory level, then check the following points.

a. Automatic volume control tube. Try interchanging it with others of a similar type or replacing it with a new one.

b. Volume control. Normally the volume control is of 50,000 ohms resistance. If for any reason it should be less, then the fixed resistor R-16 must also be reduced in value so that the proportion of 50,000 ohms to 70,000 ohms is maintained. For example—if the volume control measures 30,000 ohms, the fixed resistor should be replaced with one of 42,000 ohms. Such a replacement is much easier than a replacement of the complete volume control.

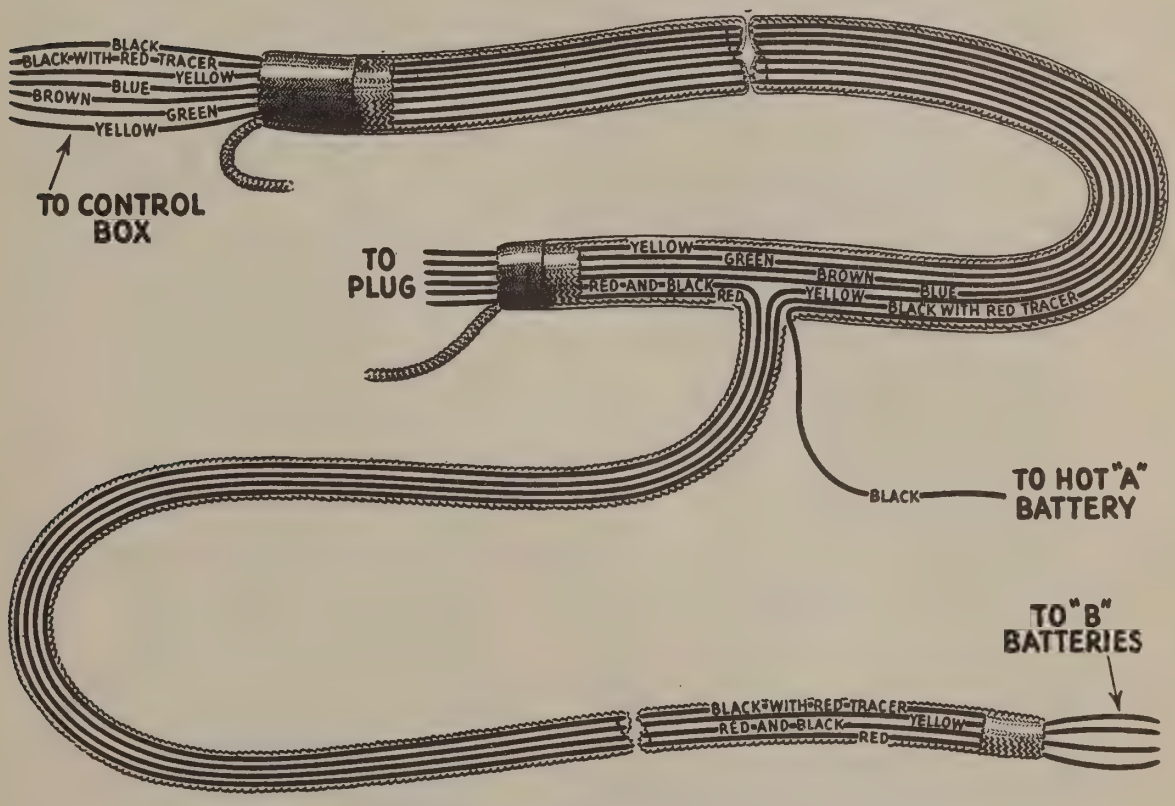


Figure 27—Internal Connections of Cables

PART IV—REPLACEMENT PARTS

On the following pages the parts that are required for replacement use are listed. It will be noted that several parts not included in the standard equipment are also listed. There are respectively, several types of ignition suppressors and special length flexible shafts. Reference to these parts has been made in the text and on some special installations they will be required.

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
	RECEIVER ASSEMBLY	
2240	Resistor—30,000 ohms—Carbon type —1 watt	$0.70
2546	Resistor—1 megohm—Carbon type—1 watt—Package of 5	3.00
2736	Resistor—170 ohms—Carbon type—1 watt—Package of 5	2.00
2741	Idler—Tuning capacitor drive idler—Package of 5	.80
2742	Spring—Tuning capacitor drive tension spring—Package of 5	.50
2747	Cap—Grid contactor cap—Package of 5	.50
2749	Capacitor—2400 mmfd.	1.50
2966	Resistor—28,000 ohms—Carbon type —1 watt—Package of 5	2.50
2994	Coil—2nd detector R.F. choke coil	.60
3048	Resistor—500,000 ohms—Carbon type —½ watt—Package of 5	2.50
3078	Resistor—10,000 ohms—Carbon type —— watt—Package of 5	2.50
3118	Resistor—100,000 ohms—Carbon type —¼ watt—Package of 5	2.00
3288	Socket—UY Radiotron socket—Complete with insulation strip	.50
6133	Socket—UX Radiotron socket—Complete with insulation strip	.50
6134	Resistor—1200 ohms—Carbon type—1 watt—Package of 5	2.00
6135	Resistor—270 ohms—Carbon type—¼ watt—Package of 5	2.00
6136	Resistor—3500 ohms—Carbon type—1 watt—Package of 5	2.00
6137	Coil—R.F. coil	1.90
6138	Coil—1st detector and oscillator coil	3.30
6139	Cord—Tuning condenser drive cord—Package of 5	.65
6140	Plug—6 prong male plug and plug receptacle	.50
6141	Receptacle—Two prong receptacle for speaker cord plug—Package of 2	.70
6142	Resistor—6,000 ohms—Carbon type—½ watt—Package of 5	2.00
6143	Resistor—40,000 ohms—Carbon type —¼ watt—Package of 5	2.00
6144	Resistor—4 ohms—Flexible wire type —Package of 5	1.00
6145	Cover Plate—Adjustable capacitor adjustment cover plate—Located on back receiver shield—Package of 5	.50
6146	Screw—Self tapping hex head screw—For mounting cover plates to shield —Package of 40	.60
6147	Nut—Wing nut for receiver shield—Package of 20	.60
6148	Fuse—10 amperes—Package of 5	.50
6149	Bumper—Rubber bumpers—Located on receiver mounting bracket—Package of 10	.50
6150	Plug—Six prong female plug—Located on main cable	.50

Stock No.	DESCRIPTION	List Price
	RECEIVER ASSEMBLY—Continued	
6151	Suppressor—Spark plug type suppressor	$0.65
6152	Suppressor—Distributor type suppressor	.65
6175	Suppressor—Distributor splice-in suppressor	.65
7062	Capacitor — Adjustable capacitor — 15–70 mmfd.	1.00
7065	Micarta Screw Driver—Used for I. F. and R. F. adjustment	1.10
7299	Capacitor—745 mmfd.	.70
7421	Capacitor pack—Comprising two 0.5 mfd., two 0.018 mfd., three 0.1 mfd., two 0.25 mfd. and one 4.0 mfd. capacitors in metal container	5.25
7422	Transformer—1st intermediate transformer	2.50
7423	Transformer—2nd intermediate transformer	2.50
7424	Transformer—Output transformer	1.85
7425	Transformer—Interstage transformer	2.20
7426	Board—Resistor board complete, less resistors, coil and capacitor	.75
7427	Cover plate—Intermediate adjustment cover plate—Located on front receiver shield—Package of 5	.50
7428	Cover plate—Tuning capacitor trimmer adjustment cover plate—Located on top receiver shield—Package of 5	.50
7429	Capacitor—0.625 mfd.—In metal casing with mounting bracket	2.20
8821	Capacitor assembly—Tuning capacitor assembly—Comprising 3 variable capacitors, drive bracket, drive cord, drive shaft and drum—Assembled	8.60
8822	Flexible drive shaft—Length 30"—From control box to receiver	4.90
8823	Shield—Back cover shield for receiver chassis	2.05
8824	Shield—Front cover shield for receiver chassis	1.10
8825	Shield—Top cover shield for receiver chassis	1.15
8826	Bracket—Receiver chassis mounting bracket complete with two rubber bumpers	1.20
8827	Cable—Main cable less plug—From control box to receiver chassis and battery box	2.20
8833	Flexible drive shaft—Length 42"—From control box to receiver	8.65
8834	Flexible drive shaft—Length 54"—From control box to receiver	9.35
8835	Flexible drive shaft—Length 66"—From control box to receiver	9.65
8836	Flexible drive shaft—Length 78"—From control box to receiver	10.40

Order By Stock Number Only

REPLACEMENT PARTS—(Continued)

Stock No.	DESCRIPTION	List Price
	CONTROL BOX ASSEMBLY	
3287	Label—Metal trade mark label—Package of 5	$0.75
6153	Clamp—For clamping control box to steering wheel shaft—Package of 5	.50
6154	Screw — Clamp mounting screw — Package of 50	.50
6155	Shaft—Tuning dial shaft with gear and drive washer—Package of 5	1.25
6156	Switch—Lock switch—Complete with mounting nut and washer	.80
6157	Volume control—Volume control complete with mounting nut	1.50
6158	Nut—Knurled nut for lock switch—Package of 10	.50
6159	Resistor—70,000 ohms—Carbon type —½ watt—Package of 5	2.00
6160	Dial scale—Package of 5	.50
6161	Knob—Tuning control knob—Package of 5	1.50
6162	Spring—Knob tension spring—Package of 25	.50
6163	Knob—Volume control knob—Package of 5	1.50
6164	Key—Lock switch key—Package of 10	.50
6165	Lamp—Dial scale lamp—Package of 5	1.75
6169	Felt—Felt strip for steering column—Package of 10	.50
7430	Control box complete—Less flexible shaft and cable	5.25
7431	Cover assembly—Comprising top and bottom covers	1.20
7432	Bracket assembly—Comprising brackets, studs, stop washer and lamp socket—Located inside of control box	3.45
	LOUDSPEAKER ASSEMBLY	
2975	Rivet—Cone retaining ring mounting rivet—Package of 100	.50
6166	Board—Terminal board with two terminals—Located on cone bracket —Package of 5	1.00
6167	Plug—Two prong male plug—For cable No. 8832—Package of 5	.75
6170	Rivet—For mounting speaker and front grille into housing—Package of 100	.50
6171	Rivet—For mounting No. 8831 bracket to housing—Package of 100	.50
7433	Screen-Speaker housing case wire screen —Package of 5	1.50
7434	Screen—Dust screen for back of speaker housing case—Package of 5	1.75
8702	Ring—Cone retaining ring	.80
8828	Magnet assembly—Comprising cone bracket, core and magnet	4.60

Stock No.	DESCRIPTION	List Price
	LOUDSPEAKER ASSEMBLY —Continued	
8829	Cone—Speaker paper cone. Package of 5	$8.00
8830	Housing—Speaker housing complete—Comprising front screen, back dust screen, case and mounting bracket	3.00
8831	Bracket assembly—Speaker housing bracket — Comprising bracket, 2 mounting bolts, 4 washers and 4 nuts	.95
8832	Cable—Speaker shielded cable less plug	.55
8838	Speaker complete—Comprising Speaker, housing case and cord—Assembled	13.50
	ANTENNA ASSEMBLY	
6129	Staple—Insulated staple—Package of 100	.75
6130	Screw and Nut—U bracket set screw —⅜—16 x 1¼—Complete with lock nut—Package of 10	.50
6131	Insulator—Insulator bushing for No. 7420—Package of 10	.70
7419	Bracket—U bracket for mounting antenna plates—Package of 2	1.00
7420	Stud—Antenna plate stud—⅜—16 x 8"—Complete with 5 mounting nuts—Package of 5	1.90
8819	Plate—Single antenna plate	1.75
	BATTERY BOX ASSEMBLY	
2968	Receptacle—Four prong receptacle complete	.50
6122	Clamp—Cable clamp—Package of 15	.50
6123	Plug—Four prong male plug	.50
6124	Cap—Plug cover rubber cap for No. 6123—Package of 5	1.50
6125	Fuse—¼ amperes—Package of 5	.50
6126	Clip—Fuse clip—Package of 12	.50
6127	Bolt—Carriage bolt for mounting top of box to car—5/16—18 x 1¼"—Complete with lock nut—Package of 5	.50
7418	Bolt—Hanger bolt 5/16—18 x 9¾"—Complete with two lock nuts—Package of 5	.50
8817	Box body assembly—Comprising bottom plate, 2 side plates, 2 bottom strips and receptacle—Assembled	3.45
8818	Box cover assembly—Comprising cover plate, 2 strips and 2 rubber strips —Assembled	1.70
8820	Plate and strip assembly—Cardboard plate and strip assembly comprising six strips and one plate — Package of 5	.75

Order By Stock Number Only

PART V—INSTALLATION DATA

On the following pages, data pertaining to the actual installation of the automobile radio on a number of standard cars is tabulated. On the back of each sheet, blank space is allowed for keeping notes on each individual job. Additional sheets will be issued on other models as this data becomes available.

RCA Victor
Portable Radiola P-31

SERVICE NOTES

RCA Victor Portable Radiola P-31

SERVICE DIVISION

RCA Victor Company, Inc.

Camden, N.J.

A RADIO CORPORATION OF AMERICA SUBSIDIARY

REPRESENTATIVES IN PRINCIPAL CITIES

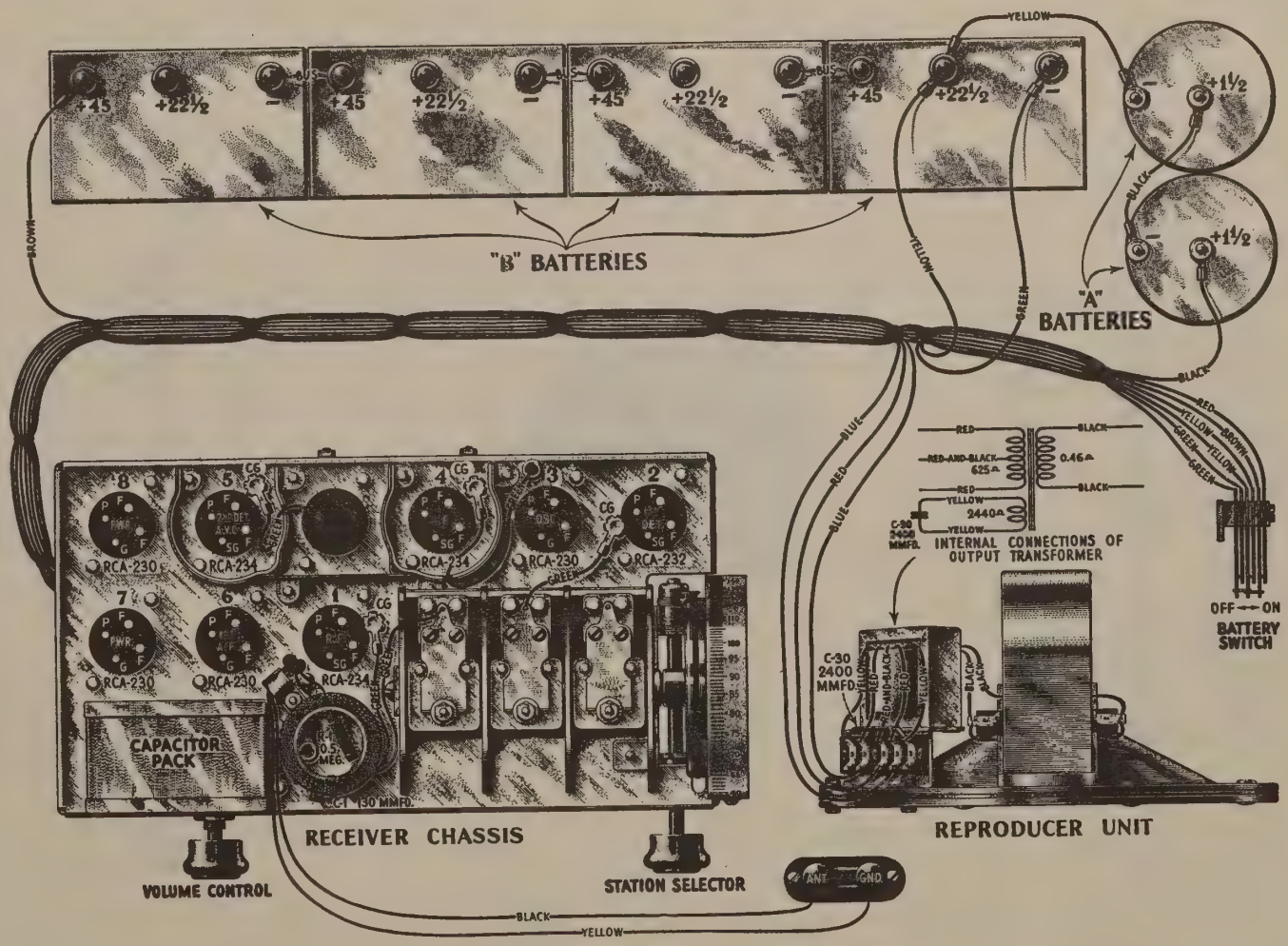


Figure 1.—Assembly Wiring Diagram

SERVICE NOTES

for

RCA Victor Portable Radiola P-31

ELECTRICAL SPECIFICATIONS

"A" Batteries required	Two No. 6 Dry Cells
"B" Batteries required	Four 45 volt blocks such as Burgess 5308
"A" Battery Current	0.48 Amps.
Average "B" Battery Current	18 M. A.
Type of Circuit	Super-Heterodyne with A. V. C.
Type and Number of Radiotrons	3 RCA-234, 1 RCA-232, 4 RCA-230
Number of R. F. Stages	One
Type of First Detector	Tuned Input Grid Bias
Number of Intermediate Stages	One
Type of Second Detector	Pentode combining detector, A. V. C. and audio amplification
Number of Audio Stages	Two
Type of Audio Output Amplifier	Class "B"
Undistorted Output	0.75 Watts

PHYSICAL SPECIFICATIONS

Height	14 3/16 inches
Depth	9 5/8 inches
Width	21 1/4 inches
Weight Alone (less batteries)	32 lbs.
Weight Packed for Shipment	43 lbs.
Weight of Batteries	17 lbs.

RCA Victor Portable Radio P-31 is an eight tube battery operated super-heterodyne radio receiver incorporating such features as Super-Control R. F. Amplifier Pentode Radiotrons in the R. F. and I. F. Stages, automatic volume control, combination Pentode second detector, class "B" audio amplifier and the inherent sensitivity, selectivity and tone quality of the RCA Victor Super-heterodyne. The entire mechanism, permanent magnet dynamic loudspeaker and all batteries are enclosed in a portable type container.

ELECTRICAL DESCRIPTION OF CIRCUIT

As the circuit used in the P-31 is somewhat different from the usual circuit, a description of its functioning is of help in properly understanding the operation of the set.

The input from the antenna is coupled to the grid circuit of the first R. F. stage through an R. F. transformer, the secondary of which is tuned to the frequency of the incoming signal. A 130 mmfd. capacitor is placed in series with the antenna to reduce the effects of the variation in antenna capacity from affecting the tuning of the input circuit.

The output of the R. F. Stage is coupled inductively to the grid circuit of the first detector together with the output of the oscillator, the grid circuit of the first detector is tuned by means of the second of the gang condensers to the frequency of the incoming signal. The oscillator is tuned to a frequency of 175 K. C. greater than the incoming signal by the third unit of the gang condenser. The combining of these two frequencies produces a beat frequency—175 K. C.—which appears in the plate circuit of the first detector.

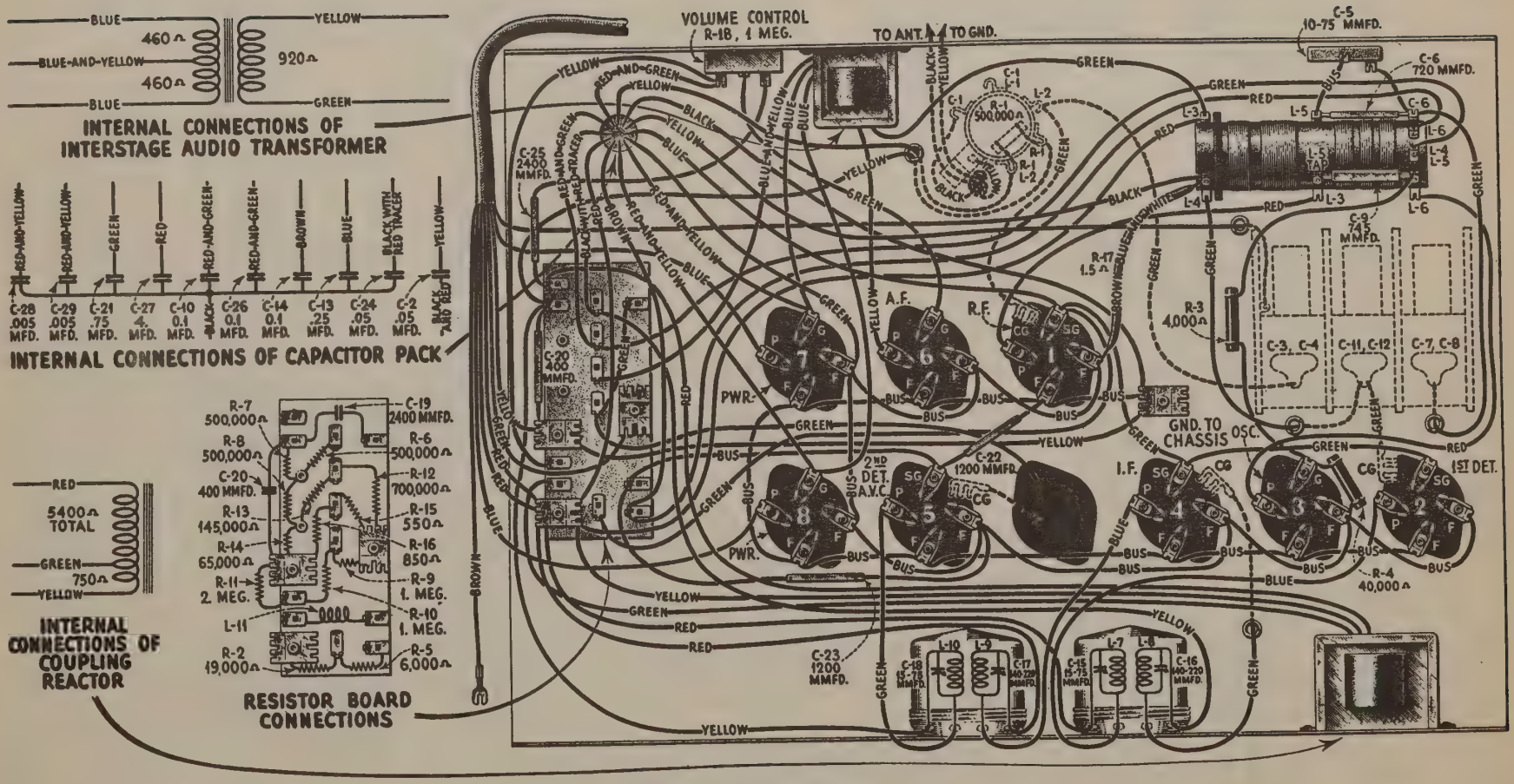


Figure 2.—Wiring Diagram

The plate circuit of the first detector, the grid circuit of the I. F. amplifier, the plate circuit of the I. F. amplifier and the grid circuit of the second detector are all tuned to 175 K. C.

The Radiotrons used for the R. F. and I. F. stages are the new Super-Control R. F. Amplifier Pentode Radiotrons, RCA-234. This Radiotron differs from the usual Super-Control Screen grid Radiotron in that it has a suppressor grid, similar to that in an output Pentode. Its characteristics are generally the same as the RCA-232 Screen grid Radiotron except for its exponential characteristics. The RCA-232 is used as a first detector.

The Radiotron RCA-234 used as the second detector is also the automatic volume control. It is a diode detector, being a straight rectifier, a triode audio amplifier and a bias control automatic volume control, the signal current across a resistor giving the necessary voltage drop. Details of its functioning follow. Refer to Figure 3 the schematic circuit.

The signal voltage is applied to the filament and plate of the second detector, being rectified by straight diode action. The audio output is then applied to the control grid and filament by means of capacitor C-19. The tube then operates as an Audio Amplifier, the screen grid acting as the plate. Now examining the input circuit it will be noted that the signal current flows through resistors R-7 and R-8. The drop across resistor R-8 constitutes the control grid bias for the I. F. amplifier and the drop across R-7 and R-8 constitutes the control grid bias for the R. F. stage. A small initial bias—1.5 volts— is present on these tubes being the drop across the 65,000 ohm resistor of the voltage dividing system. Also the control grid bias for the second detector is obtained from the drop across the resistors R-10 and R-11, while R-9 and R-10 in parallel constitute a grid leak for its operation as an audio amplifier, C-19 being the coupling capacitor.

The output of the detector is then coupled by means of impedance coupling to the grid of the first A. F. amplifying tube. The grid leak is in the form of a potentiometer which is the volume control, its action controlling the audio voltage applied to the grid of the first A. F. tube. The output of this tube is then applied to the grids of the two Radiotrons RCA-230 which are connected in Push-Pull as a Class "B" amplifier. The output of this stage is then transformer coupled to the cone coil of the permanent magnet dynamic type loudspeaker. An extra winding, shunted by a capacitor, acts as a high frequency cut-off.

SERVICE DATA

Service Data on the RCA Victor Portable Radiola P-31 is similar to that of other RCA Victor Super-Heterodyne receivers. Alignments of the R. F., Oscillator and I. F. stages should be made in a manner similar to that described in the Service Notes on the Automobile Radiola M-30. The location of the various line-up capacitors is the same as that of the M-30.

In making line-up adjustments on the P-31, there is one important feature that affects this operation, that should be remembered. That feature is the automatic volume control. Due to it being a combined A. V. C. and second detector, it cannot be removed from its socket or replaced with a dummy Radiotron.

R. F., OSCILLATOR AND I. F. ADJUSTMENTS

The R.F., Oscillator and I.F. Adjustments in Model P-31 are similar to those of the Automobile Radiola M-30. However, due to the A.V.C. tube also being the second detector, it cannot be removed while line-up adjustments are made. The proper manner in making this adjustment is as follows:

(a) Set the volume control of the receiver at maximum.

(b) Reduce the output of the external oscillator or its coupling to the receiver until a definite reduction in output meter reading is obtained. The oscillator output should again be reduced until but a slight indication in the output meter is obtained. At this low input the A.V.C. action is not sufficiently flat to interfere with the proper alignment of the various circuits.

RADIOTRON SOCKET VOLTAGES

(No Signal Being Received)

Radiotron No.	Control Grid to Filament Volts	Screen Grid to Filament Volts	Plate to Filament Volts	Screen Current M. A.	Plate Current M. A.	Filament Volts
1. R. F.	0.2	65	150	1.0	3.0	2.0
2. 1st Det.	0.5	65	150	0.1	0.2	2.0
3. Osc.	1.0	—	45	—	3.0	2.0
4. I. F.	0.5	65	150	1.0	3.0	2.0
5. 2nd Det.	2.0	150	—1.5	4.0	0	2.0
6. 1st A. F.	1.0	—	145	—	2.5	2.0
7. Power	14.0	—	150	—	1.5	2.0
8. Power	14.0	—	150	—	1.5	2.0

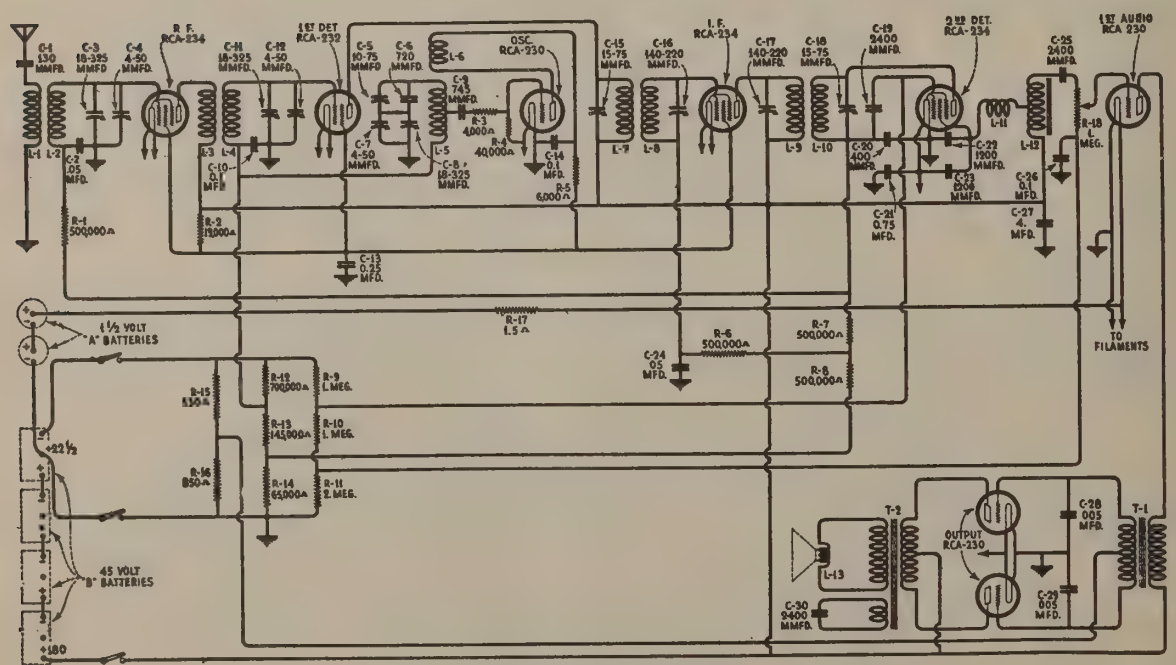


Figure 3.—Schematic Circuit

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
	RECEIVER ASSEMBLY	
2269	Capacitor—720 mmfd.	$0.75
2740	Cord—Tuning condenser drive cord—Package of 5.	1.00
2741	Idler—Tuning condenser drive cord idler—Package of 5	.80
2742	Spring—Tuning condenser drive cord tension spring—Package of 5	.50
2748	Binding post—Ground—Antenna twin binding post.	.50
2749	Capacitor—2400 mmfd.	1.50
2994	Coil—Detector choke coil complete with mounting rivet	.60
3033	Resistor—1 megohm—Carbon type—¼ watt—Package of 5	2.00
3079	Resistor—40,000 ohms—Carbon type—½ watt—Package of 5	2.50
3085	Capacitor—400 mmfd.	.60
6133	Socket—Four contact Radiotron socket complete with insulator—8 used	.50
6138	Coil—1st detector and oscillator coil complete with mounting brackets	3.30
6186	Resistor—500,000 ohms—Carbon type—¼ watt—Package of 5	2.00
6239	Volume control—Volume control complete with mounting nut—Package of 5	5.25
6240	Resistor—19,000 ohms—Carbon type—½ watt—Package of 5	2.00
6241	Resistor—140,000 ohms—Carbon type—¼ watt—Package of 5	2.00
6242	Resistor—2 megohm—Carbon type—½ watt—Package of 5	2.00
6243	Resistor—6,000 ohms—Carbon type—¼ watt—Package of 5	2.00
6244	Resistor—700,000 ohms—Carbon type—¼ watt—Package of 5	2.00
6245	Resistor—65,000 ohms—Carbon type—¼ watt—Package of 5	2.00
6246	Resistor—550 ohms—Carbon type—¼ watt—Package of 5	2.00
6247	Resistor—850 ohms—Carbon type—¼ watt—Package of 5	2.00
6248	Capacitor—130 mmfd.—Package of 5	1.50
6249	Resistor—1.5 ohms—Flexible type—Package of 5	1.25
6250	Resistor—4,000 ohms—Carbon type—½ watt—Package of 5	2.00
6251	Capacitor—1200 mmfd.—Package of 5	2.30
6252	Scale—Dial scale—Package of 5	1.50
6256	Switch—Off and On switch	1.80
6258	Knob—Off and On switch knob—Package of 5	1.20
6259	Screw—Receiver chassis mounting bracket self tapping screw—Package of 25	.85
6260	Brackets—Receiver chassis mounting brackets R.H. and L.H.—Package of 5 sets	2.20
6261	Knob—Tuning control knob and screw—Package of 5	1.25
6262	Screw assembly—Receiver mounting screw assembly—Comprising 4 screws, 4 eyelets, 4 lock washers, 2 flat washers and 12 nuts—Package of 1 set	.70
7062	Capacitor—Adjustable capacitor—15–70 mmfd.	1.00
7299	Capacitor—745 mmfd.	.70
7425	Transformer—Interstage transformer	2.20
8889	Transformer—Input transformer	2.30
8890	Capacitor pack—Comprising two 0.005 mfd., one 0.75 mfd., one 4.0 mfd., three 0.1 mfd., one 0.25 mfd. and two 0.05 mfd. capacitor in metal container	$5.40
8891	Transformer—1st intermediate transformer	2.80
8892	Transformer—2d intermediate transformer	2.90
8893	Board—Resistor board complete less resistors, coil and capacitor	1.00
8894	Coil—R.F. coil—Complete with mounting bracket	2.30
8895	Capacitor—3 gang variable tuning capacitor—Comprising 3 variable capacitors drive drum, drive cord, drive cord spring, idlers and drive cord guides—Assembled	7.75
8898	Cable	1.15
	LOUDSPEAKER ASSEMBLY	
2749	Capacitor—2400 mmfd.	1.50
2975	Rivet—Cone retaining ring mounting rivet—Package of 100	.50
6166	Board—Terminal board with two terminals—Located on cone bracket—Package of 5	1.00
6253	Board—Speaker terminal board—5 terminals—Complete with mounting eyelets—Package of 5	1.00
6254	Transformer—Output transformer	2.20
6255	Screw assembly—Speaker mounting screw assembly—Comprising 4 screws, 4 eyelets, 4 cushions, 4 bushings, 8 nuts and 8 lock washers—Package of 1 set	1.15
8828	Magnet assembly—Comprising cone bracket core and magnet	4.60
8829	Cone—Speaker paper cone—Package of 5	8.00
8896	Ring—Speaker cone retaining ring	.90
	CABINET ASSEMBLY	
X-89	Grille and grille cloth—Receiver side—Package of 2.	1.30
X-90	Board—Speaker baffle board and grille cloth—Package of 2	1.30
X-91	Panel—Control panel less equipment	4.70
X-92	Escutcheon—Tuning dial escutcheon complete with mounting screws	1.15
6257	Escutcheon—Off and On escutcheon—Package of 10.	1.35
6263	Knob and screw—Located on bottom of control panel—Package of 5	1.50
6264	Knob—For locking control panel in cabinet—Package of 5	2.20
6265	Lock—Lid lock—Comprising lock, lock keeper, lock spacer and six mounting rivets—NOT KEY TYPE—Package of 5	3.50
6266	Clamp—Battery clamp—Package of 10	1.70
6267	Lock—Lid lock—Comprising lock, lock keeper, lock spacer, key and six mounting rivets—KEY TYPE—Package of 5	4.60
6268	Key—Cabinet lock key—Package of 10	1.60
6269	Bracket—Corner bracket with mounting rivets—Package of 10	1.80
6270	Hinge—Cabinet bottom swivel hinge with mounting rivets—Case side—Package of	1.85
6271	Hinge—Cabinet bottom swivel hinge with mounting rivets—Lid side—Package of 5	1.85
8897	Coverings—Cabinet coverings—Comprising one bottom outside cover, one top outside cover, one top inside cover and eight corner bindings—Package of 1 set	5.40
9411	Cabinet—Cabinet complete less equipment	29.00
10123	Handle—Carrying handle with 2 brackets	1.00

TRADE MARKS REG. U.S. PAT. OFF.
MARCAS REGISTRADAS

S.O. 8912 10M 2-12-32

RCA Victor M-32

Automobile Radiola

Superheterodyne

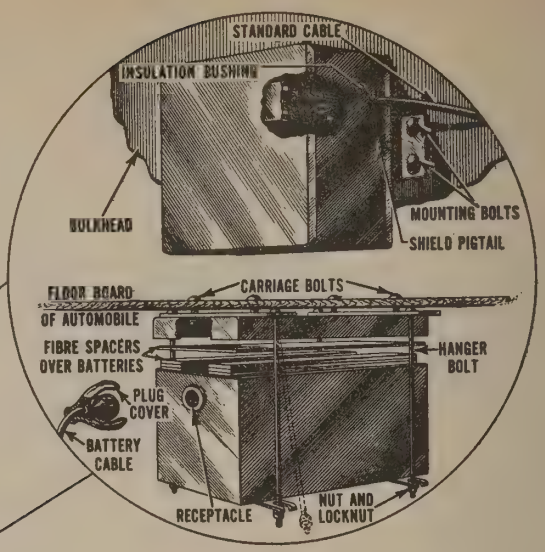
TRADEMARKS REGISTERED U. S. PAT. OFF.
MARCAS REGISTRADAS

INSTRUCTIONS

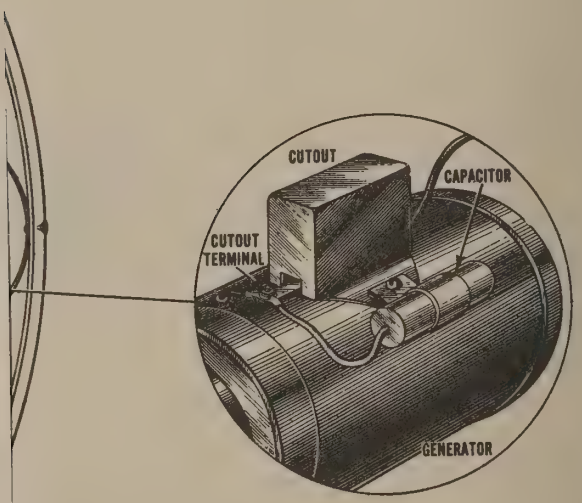
RCA Victor Company, Inc.

Camden, N. J., U. S. A.

"B" BATTERY ELIMINATOR

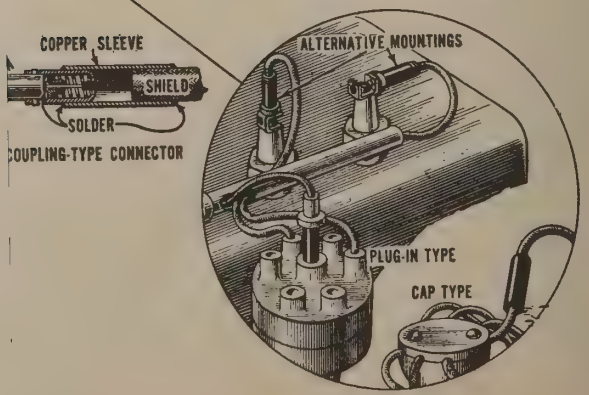


BATTERY BOX



GENERATOR CAPACITOR

SPARK PLUG SUPPRESSORS



COUPLING-TYPE CONNECTOR

DISTRIBUTOR SUPPRESSORS

Instructions for

RCA Victor M-32

Automobile Radiola

INTRODUCTION

This automobile radio receiver utilizes a highly-efficient six-tube Superheterodyne circuit, a remote control unit, and a newly-designed electrodynamic loudspeaker. Because of the inherently adverse conditions to which an instrument of this type is subjected, more attention should be given to its installation than is required by a modern radio for the home. Comparable performance, however, will be obtained if these instructions are carefully followed, both with respect to installation and operation.

Three new-type Radiotrons are used: (1) the "r-f exponential pentode" RCA-39, (2) the "duo-diode triode" RCA-85, and (3) the "a-f power pentode" RCA-89. These tubes incorporate the most recent engineering features and contribute materially to the outstanding performance of this receiver. An innovation in design is found in the use of Radiotron RCA-85 which combines automatic volume control with the normal function of the second detector in a single stage.

The receiver unit is extremely compact and is enclosed by a metallic shield case. The case may be quickly detached from its mounting bolts, thereby affording maximum convenience in replacing Radiotrons or other servicing. The remote control unit is arranged for clamping to the steering column and thus places the volume and tuning controls and the key-operated power switch readily accessible to the driver. The dial scale, located only slightly below the normal driving line of vision, is glare-proof illuminated and is calibrated to facilitate frequency selection.

High-quality reproduction is obtained by use of the new electrodynamic loudspeaker. This unit is protected against mechanical injury by enclosure in an acoustically correct and attractive metallic container equipped with tone equalizers.

Plate voltage supply for the Radiotrons is obtained from an economical "B" battery eliminator unit which is furnished as a part of the standard equipment. (A special companion model of this receiver without the eliminator and suitable for operation from external "B" batteries, is available if preferred. See Appendix I.) Equipment for the suppression of ignition interference is included with the instrument.

The use of a roof antenna in all installations is recommended. Satisfactory results in many cases, however, may be obtained with a plate-type antenna mounted beneath the floor of the car.

PART I—INSTALLATION

Equipment

A. Equipment Furnished:

1. Receiver Unit—complete with the following Radiotrons:
   - (a) Three RCA-39.
   - (b) One RCA-37.
   - (c) One RCA-85.
   - (d) One RCA-89.
2. Loudspeaker—with cable and connector plug, washer, and nuts (2).
3. "B" Battery Eliminator Unit.
4. Outfit Package—containing:
   - (a) Remote Control Unit—with bracket, felt, screws, and interconnecting cable.
   - (b) Switch Keys (2) and Fuse—packed in Instruction envelope (attached to control knob of item a).
   - (c) Flexible Shafts (2) and Set Screws (6).
   - (d) Antenna Coupling Connector Sleeve.
   - (e) Mounting Brackets (4) (for receiver and "B" battery eliminator units)—complete with screws (8), bolts (8), nuts (16), washers (8), and lockwashers (8).
   - (f) Insulation Bushing (for cable entrance slot in "B" battery eliminator unit).
   - (g) Wiring Clamp (for loudspeaker cable).
   - (h) Ignition Interference Suppression Equipment:
     - 6 Sparkplug type suppressors (additional obtainable from your Dealer).
     - 1 Distributor type suppressor.
     - 2 Capacitors.
   - (i) Instruction Book

B. Additional Equipment Required:

1. Antenna—
   - (a) Roof (built-in) type recommended.
   - (b) Plate (sub-mounted) type—alternative. A special plate antenna complete with mounting clamps, studs, and lead-in wire is obtainable from your Dealer, if required.

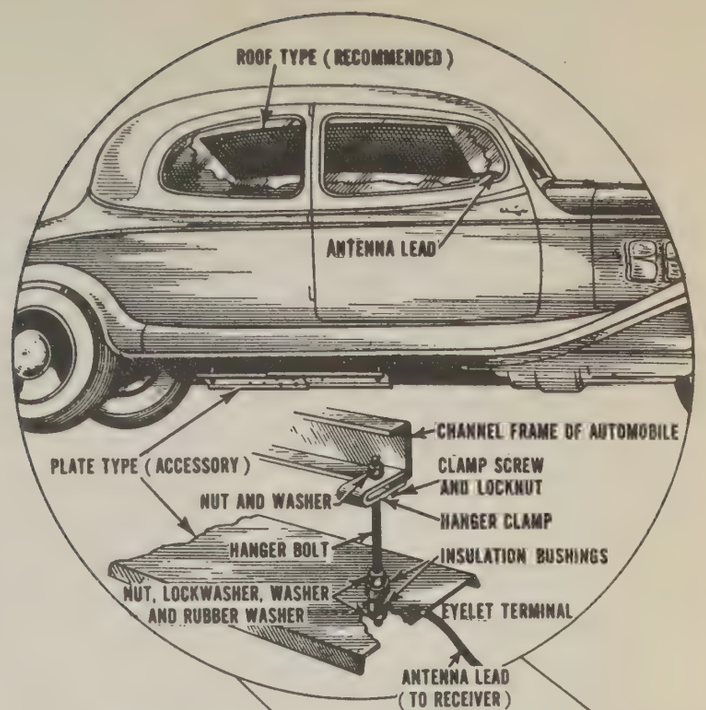
Location of Units

The arrangement of units shown in Figure 1 is applicable to the majority of automobiles. In certain installations, however, such locations may be considered impractical or not in accordance with personal preference, thereby necessitating a slight change in layout. The following suggestions will be of assistance in determining the most suitable position for each unit in any given case.

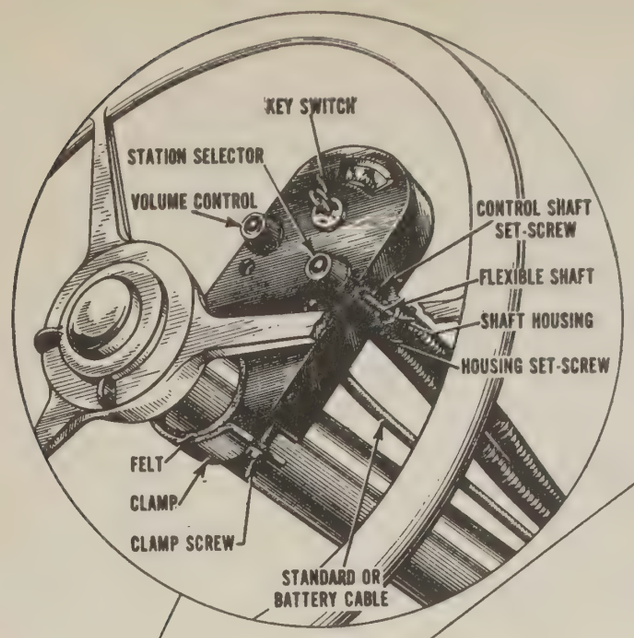
Receiver and Loudspeaker—In mounting these units, the adaptability of both to bulkhead (the partition between the engine and driving compartments) suspension should be determined initially. Consideration should be given to the space available and to the possibility of interference of the units with other equipment beneath the instrument panel or of the mounting bolts with apparatus on the engine side of the bulkhead.

Remote Control Unit—The control unit should be mounted on the steering column in a position chosen to afford greatest accessibility.

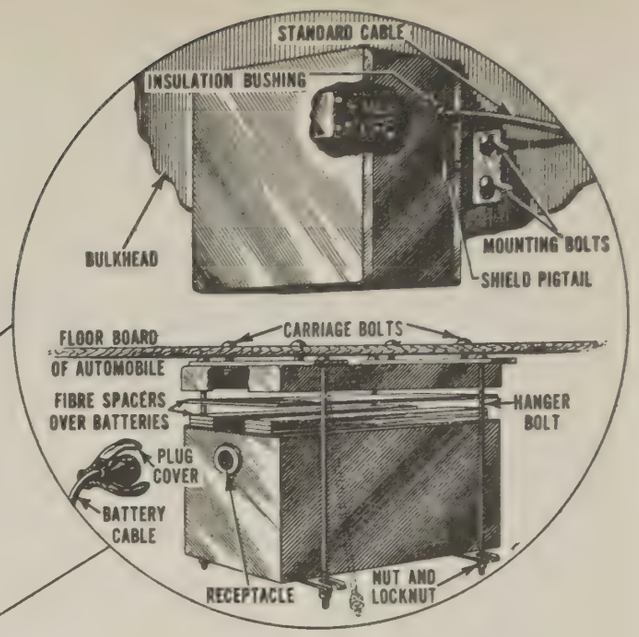
ANTENNA



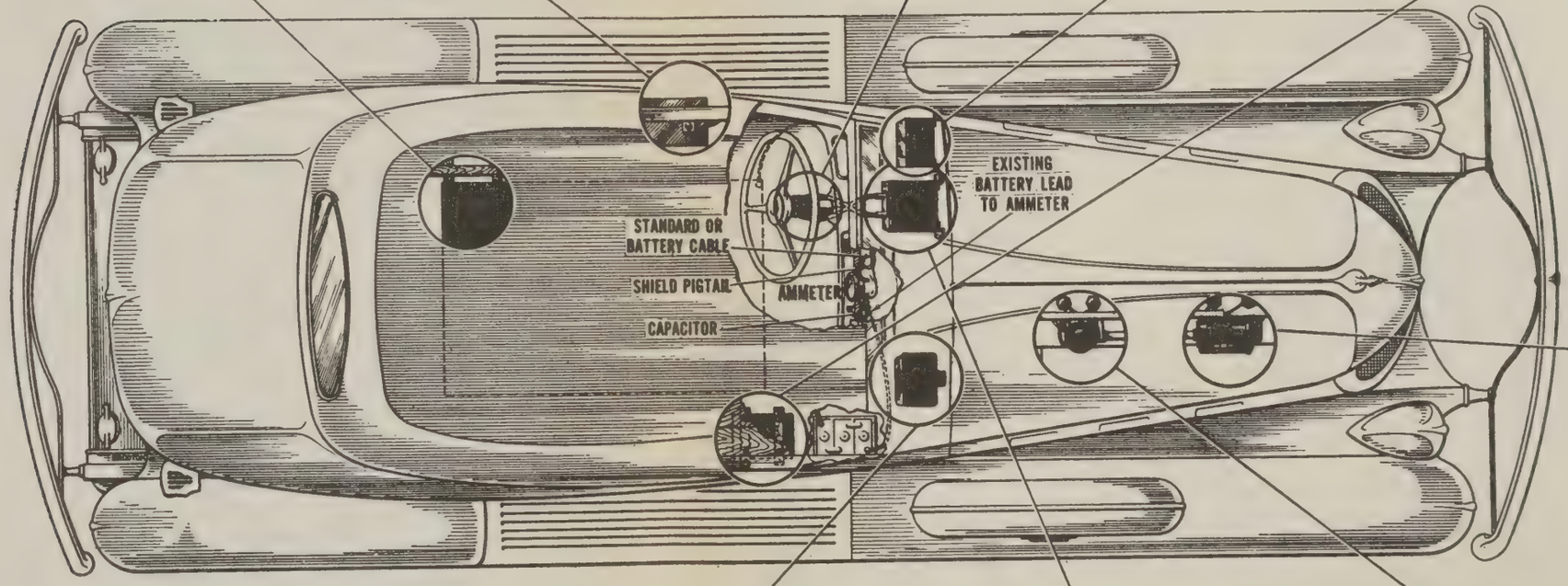
REMOTE CONTROL UNIT

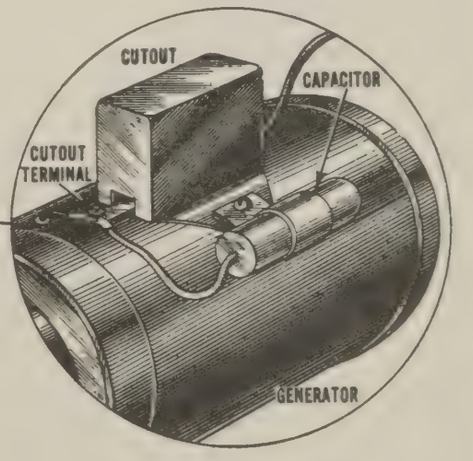


"B" BATTERY ELIMINATOR

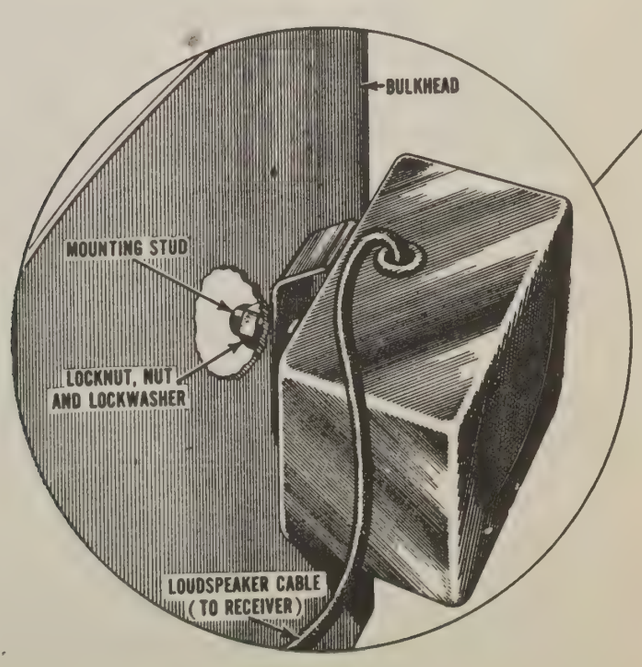


BATTERY BOX

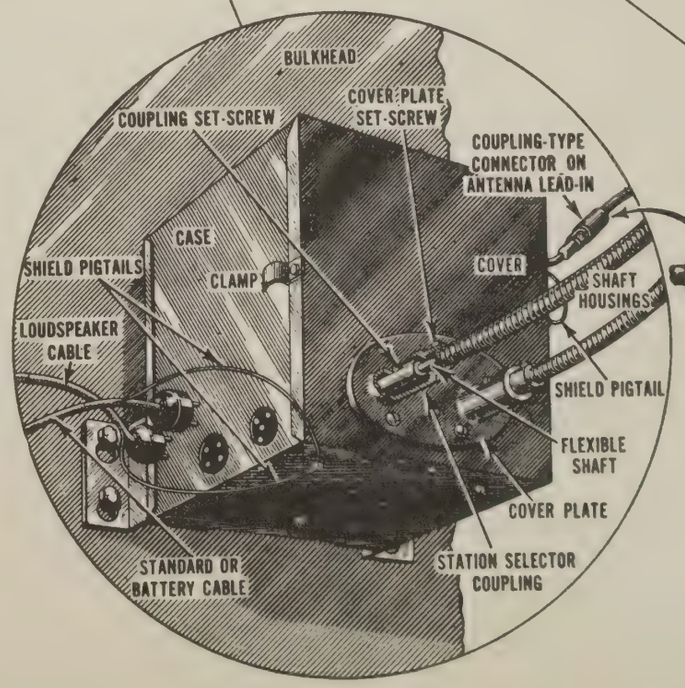




GENERATOR CAPACITOR



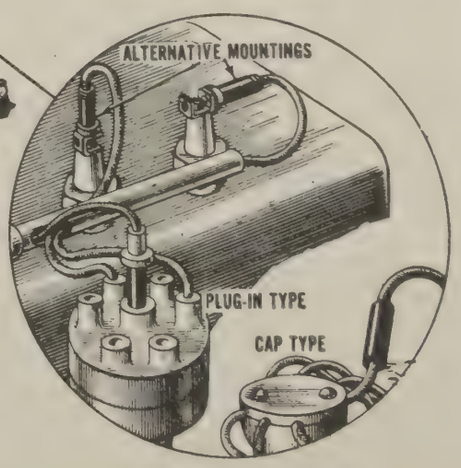
LOUDSPEAKER



RECEIVER

COUPLING-TYPE CONNECTOR

SPARK PLUG SUPPRESSORS



DISTRIBUTOR SUPPRESSORS

.0074 (1-7)

Figure 1

Instructions for

RCA Victor M-32

Automobile Radiola

INTRODUCTION

This automobile radio receiver utilizes a highly-efficient six-tube Superheterodyne circuit, a remote control unit, and a newly-designed electrodynamic loudspeaker. Because of the inherently adverse conditions to which an instrument of this type is subjected, more attention should be given to its installation than is required by a modern radio for the home. Comparable performance, however, will be obtained if these instructions are carefully followed, both with respect to installation and operation.

Three new-type Radiotrons are used: (1) the "r-f exponential pentode" RCA-39, (2) the "duo-diode triode" RCA-85, and (3) the "a-f power pentode" RCA-89. These tubes incorporate the most recent engineering features and contribute materially to the outstanding performance of this receiver. An innovation in design is found in the use of Radiotron RCA-85 which combines automatic volume control with the normal function of the second detector in a single stage.

The receiver unit is extremely compact and is enclosed by a metallic shield case. The case may be quickly detached from its mounting bolts, thereby affording maximum convenience in replacing Radiotrons or other servicing. The remote control unit is arranged for clamping to the steering column and thus places the volume and tuning controls and the key-operated power switch readily accessible to the driver. The dial scale, located only slightly below the normal driving line of vision, is glare-proof illuminated and is calibrated to facilitate frequency selection.

High-quality reproduction is obtained by use of the new electrodynamic loudspeaker. This unit is protected against mechanical injury by enclosure in an acoustically correct and attractive metallic container equipped with tone equalizers.

Plate voltage supply for the Radiotrons is obtained from an economical "B" battery eliminator unit which is furnished as a part of the standard equipment. (A special companion model of this receiver without the eliminator and suitable for operation from external "B" batteries, is available if preferred. See Appendix I.) Equipment for the suppression of ignition interference is included with the instrument.

The use of a roof antenna in all installations is recommended. Satisfactory results in many cases, however, may be obtained with a plate-type antenna mounted beneath the floor of the car.

PART I—INSTALLATION

Equipment

A. Equipment Furnished:

1. Receiver Unit—complete with the following Radiotrons:
   - (a) Three RCA-39.
   - (b) One RCA-37.
   - (c) One RCA-85.
   - (d) One RCA-89.
2. Loudspeaker—with cable and connector plug, washer, and nuts (2).
3. "B" Battery Eliminator Unit.
4. Outfit Package—containing:
   - (a) Remote Control Unit—with bracket, felt, screws, and interconnecting cable.
   - (b) Switch Keys (2) and Fuse—packed in Instruction envelope (attached to control knob of item a).
   - (c) Flexible Shafts (2) and Set Screws (6).
   - (d) Antenna Coupling Connector Sleeve.
   - (e) Mounting Brackets (4) (for receiver and "B" battery eliminator units)—complete with screws (8), bolts (8), nuts (16), washers (8), and lockwashers (8).
   - (f) Insulation Bushing (for cable entrance slot in "B" battery eliminator unit).
   - (g) Wiring Clamp (for loudspeaker cable).
   - (h) Ignition Interference Suppression Equipment:
     - 6 Sparkplug type suppressors (additional obtainable from your Dealer).
     - 1 Distributor type suppressor.
     - 2 Capacitors.
   - (i) Instruction Book

B. Additional Equipment Required:

1. Antenna—
   - (a) Roof (built-in) type recommended.
   - (b) Plate (sub-mounted) type—alternative. A special plate antenna complete with mounting clamps, studs, and lead-in wire is obtainable from your Dealer, if required.

Location of Units

The arrangement of units shown in Figure 1 is applicable to the majority of automobiles. In certain installations, however, such locations may be considered impractical or not in accordance with personal preference, thereby necessitating a slight change in layout. The following suggestions will be of assistance in determining the most suitable position for each unit in any given case.

Receiver and Loudspeaker—In mounting these units, the adaptability of both to bulkhead (the partition between the engine and driving compartments) suspension should be determined initially. Consideration should be given to the space available and to the possibility of interference of the units with other equipment beneath the instrument panel or of the mounting bolts with apparatus on the engine side of the bulkhead.

Remote Control Unit—The control unit should be mounted on the steering column in a position chosen to afford greatest accessibility.

Antenna—

Roof Type: Best results will be obtained by use of a roof antenna. The majority of modern automobiles (closed body types only) are already equipped with such an antenna installed at the factory, the lead-in wire from which will usually be found coiled up beneath the instrument panel. Many other earlier cars employ a piece of metallic screen—for top material support—which, if ungrounded (not in electrical contact with the metallic frame), may be readily utilized as an antenna.

NOTE—The presence of a top support screen and of grounds in that screen may be determined without removing any portion of the top fabric. Consult your Dealer as to the proper procedure for making this test.

In order to use an ungrounded support screen, one corner only of the head-lining need be removed. A shielded lead should be first soldered to the screen and then carried down the front pillar post nearest the receiver unit. Its shield covering must be soldered or bonded to the car frame prior to replacement of the head lining.

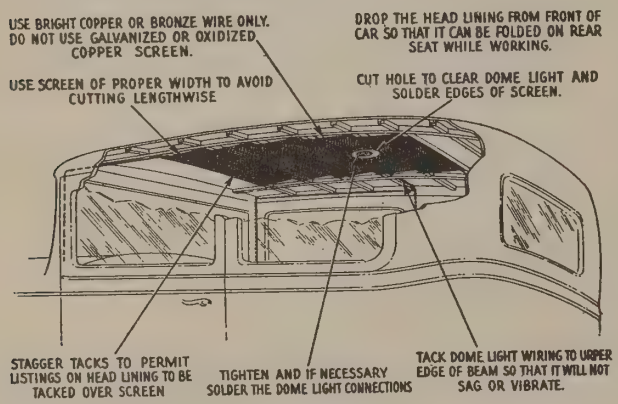

USE BRIGHT COPPER OR BRONZE WIRE ONLY. DO NOT USE GALVANIZED OR OXIDIZED COPPER SCREEN.
DROP THE HEAD LINING FROM FRONT OF CAR SO THAT IT CAN BE FOLDED ON REAR SEAT WHILE WORKING.
USE SCREEN OF PROPER WIDTH TO AVOID CUTTING LENGTHWISE
CUT HOLE TO CLEAR DOME LIGHT AND SOLDER EDGES OF SCREEN.
STAGGER TACKS TO PERMIT LISTINGS ON HEAD LINING TO BE TACKED OVER SCREEN
TIGHTEN AND IF NECESSARY SOLDER THE DOME LIGHT CONNECTIONS
TACK DOME LIGHT WIRING TO UPPER EDGE OF BEAM SO THAT IT WILL NOT SAG OR VIBRATE.

Figure 2

If the top support screen is grounded, or if no screen is present, it will be necessary to remove the entire head-lining (see Figure 2). In the former case, the screen may be insulated by removal of a strip several inches from all edges and from the dome light fixture. The possibility of subsequent shifting may be eliminated by tacking the screen to one of the ribs and by lacing the sides with cord. Where no support screen is used, a copper screen having a total area of at least ten square feet should be inserted. It should be located as far to the rear as possible and insulated from all metallic parts grounded to the frame of the car. The lead-in wire may then be attached as noted above and the head-lining replaced.

NOTE—Since a degree of skill—only acquired by experience—is necessary in removing and replacing the top fabric material, such work should be allotted to a competent "trim" man.

Plate Type: For those cases where the installation of a roof antenna is considered impractical or too costly, satisfactory reception from local or semi-distant powerful stations may be obtained by use of the special, plate-type antenna. This unit should be clamped to the frame of the chassis as far to the rear as possible. It is adjustable in length and may be mounted either lengthwise or crosswise of the chassis which position should be selected with due regard to the prevention of overcrowding. The plate must be placed as close to the ground as possible, but not below the lowest portion of the chassis at the desired location as sufficient road clearance must be retained. It is also important to avoid any position in which the plate will impede free motion of chassis parts such as springs, drive shaft, or axles in order to prevent antenna damage.

"B" Battery Eliminator—The "B" battery eliminator may be mounted at any convenient position in the car. It is preferable, however, to place this unit near the receiver and to use bulkhead suspension when sufficient space is available. To conserve mounting space, the eliminator may be fastened to the engine side of the bulkhead but, in such cases, it is important that the unit be located as far as possible from the exhaust manifold.

Mounting the Units

Details of mounting the various units are shown in Figure 1. The following procedures are recommended:

Receiver Unit—Assemble the mounting brackets (packed in receiver carton) to the rear of the shield case by means of the machine screws furnished. Support the unit in the proper location, allowing a clearance of at least one inch above the top surface to permit ready removal for servicing. On the proposed mounting surface mark the outlines of the four key-hole shaped, bracket slots. Then drill four 5/16 inch holes, coinciding with the top of the slot markings, and insert the receiver mounting bolts loosely.

The front cover of the receiver unit case (held in place by four screws) must now be removed and all packing material—inserted for protection of the Radiotrons during shipment—withdrawn. Make certain that all tubes are in position and that the control grid clips are pressed down firmly over the respective dome terminals as shown by the diagram printed on the label affixed to the top of the case. Rotate the tuning control shaft until the plates of the variable capacitor are fully meshed and adjust both shafts to positions wherein the flatted portions face upward. Then replace the front cover and tighten the cover screws in place.

NOTE—In order to further examine the radio chassis, that unit may be withdrawn from the body of the case subsequent to the removal of three screws from the lower surface. The antenna lead and the associated shield pigtail, however, must first be passed through the case side—which operation may be facilitated by detaching the small rubber bushing secured in the entrance opening.

Remote Control Unit—Detach the cover of the remote control unit by removing the push-on knobs, the knurled switch-retaining nut and the two front screws. Then insert the free end (without small coupling) of each flexible shaft housing through the rear bushings, making certain that each flexible shaft enters and extends the full depth in the drilled hole in the end of the corresponding control shaft. Tighten the control shaft set screws against the flexible shafts and finally secure the rear bushing set screws against each flexible shaft housing. The cover may now be replaced and the assembly rested in an upright position near the receiver unit.

Remove the set screws from the small couplings attached to the opposite ends of the flexible shafts and insert the shaft housings through the openings in the metallic cover plate encasing the tuning and volume control shafts of the receiver unit. ***These shafts must be so inserted as to be crossed in the final assembly as indicated by Figure 1.*** Make certain that the couplings are fully engaged over the receiver control shafts and then tighten the *cover plate screws* against each flexible shaft housing. Turn the control knobs on the remote control unit until the threaded openings for the *coupling set screws* (visible through slots in cover plate bushings) are at the top and line up with the flatted portions of the receiver unit control shafts. Finally, insert and tighten both coupling set screws.

Receiver and Remote Control Assembly—Hang the receiver unit in position over the mounting bolts and tighten those bolts in place. Then attach the remote control unit to the steering column by means of the clamp and screws provided. In order to prevent damage to the finish, the felt provided should first be wrapped around the column at the desired location and fastened with tape. After completing these operations, slowly rotate the Station Selector to each extremity of the dial, in turn, to insure use of the complete range.

NOTE—In some installations it will be found necessary or desirable to shorten the flexible shafts. This may be accomplished as follows: (1) Remove the shafts from the housings; (2) cut the housings to the proper length with a hack-saw; (3) re-insert the shafts in the housings as far as possible, so that the couplings at the receiver end of the shafts are in contact with the housings; (4) solder the protruding end of each shaft, to prevent unwinding when cut, at a point 27/32 inch beyond the end of its housing (*Important—A large soldering iron must be used to insure thorough penetration of the solder through the shaft for a distance of about one quarter inch on either side of the cutting point—use only non-corrosive soldering flux*); (5) cut each soldered shaft with a hack-saw or pliers at the point mentioned—namely, 27/32 inch (as accurately as possible) from the end of the housing; (6) remove all burrs from cut ends.

Loudspeaker—Place the loudspeaker with its cone opening against the proposed mounting surface and mark an outline of the rectangular container. Determine the exact center of this area by drawing in the diagonals and mark that position with a center-punch. Next drill a ½ inch hole at the center-punch mark and mount the loudspeaker by means of the threaded stud attached to its rear bracket. In hanging this unit, choose that position wherein the cable entrance opening is at the top.

Plate Antenna—The plate antenna, if used, should be bolted to the channel members of the automobile chassis by means of the clamps provided (see Figure 1 and notes under "Location of Units"). A shielded lead-in wire is provided with this assembly which should be brought into the driving compartment of the car through a ½ inch hole drilled in the toe-board if no other opening is available. The fully-shielded end of this wire is to be connected to the receiver unit antenna lead by means of the coupling type connector, as described under "Connections—Antenna to Receiver." Cut off the opposite (unshielded) end as required for connection to the plate and to eliminate excessive slack. The pig-tail extension from the end of the shield should be soldered or securely bonded to the frame of the car.

"B" Battery Eliminator—The "B" battery eliminator is arranged for mounting in a manner similar to that employed for the receiver unit. It is important that this machine be mounted so that the internal rotating shaft will be horizontal in assembly.

Connections

Refer to Figure 1 and make connections as follows:

Main Wiring Cable—The main wiring cable for connection between the independent units of this instrument (attached to the remote control unit during shipment) should be connected as indicated graphically. If necessary, make a loop in this cable to eliminate excessive slack and tape securely.

The power input lead contained in this cable (single shielded conductor with lug) must be connected electrically to the ungrounded side of the car storage battery, preferably at the battery terminal of the ammeter. The shield pigtail of the power input lead should be soldered or securely bonded to the instrument panel or frame of the car.

Electrical connections to the "B" battery eliminator unit are accomplished by means of the five-conductor group extending from the main wiring cable. The individual (color coded) leads are to be connected to the internal screw type terminals of the eliminator unit (rendered accessible by removal of the sheet metal case) as shown in Figure C. Appendix II. ***Prior to making these connections determine which side of the car storage battery is grounded. If the positive terminal is grounded, reverse the two leads—both from same end of dynamotor—connected to terminals 1 and 3 of filter,*** as indicated in Figure C.

NOTE—The insulation bushing (contained in Outfit Package) should first be slipped over

the five leads and, when replacing the cover, secured in the cable entrance slot. The shield pigtail should be brought out through the bushing and fastened beneath the nearest cover mounting screw.

The *special* four prong plug attached to the main wiring cable must be inserted in the corresponding socket located on the left side of the receiver unit and the shield pigtail should be secured beneath a convenient screw in the lower surface of the container.

Loudspeaker to Receiver—The *standard* four-prong plug attached to the loudspeaker cable must be inserted in the remaining socket located on the left side of the receiver unit. The pigtail extending from the cable shield should be secured beneath that container screw to which the shield extension from the adjacent main wiring cable is attached.

Antenna to Receiver—The shielded lead-in wire extending from the roof or plate antenna should be cut to a length sufficient to facilitate attachment to the coupling type connector (secured to the receiver antenna lead) and to eliminate excessive slack. Refer to the detailed view of this coupling connector in Figure 1, which shows clearly the connections to be made as follows:

The small copper sleeve (packed in Outfit Package) should be slipped over the shield braid of the lead-in wire and the small internal insulated conductor passed through the female portion of the coupling type connector. Solder this conductor securely to the end of the internal eyelet. Then slip the sleeve forward to a position wherein the adjacent ends of the connector and the shield braid are covered. Finally solder the sleeve both to the coupling and to the shield and connect the assembly to that portion secured to the receiver antenna lead. Make certain that the shield pigtail extending from the antenna entrance bushing in the receiver container is securely fastened beneath one of the cover screws.

Suppression of Ignition Interference

(1) Disconnect all wires from the spark plugs. Fasten one spark plug suppressor to the top of each plug and re-attach the wires to the free ends of the suppressors.

(2) If the distributor is of the plug-in type, disconnect the center wire from the head. Plug the distributor suppressor into the distributor head and insert the wire in the free end of the suppressor.

For cap-type distributors, proceed as follows: Exchange the distributor suppressor at your Dealer's for one of a special type. Cut the wire leading from the distributor to the coil and screw the suppressor into the end attached to the distributor. Screw the other end of the wire (leading to the coil) into the opposite end of the suppressor.

(3) Clamp one of the by-pass capacitors against the generator frame. The screw holding the cut-out ordinarily may also be utilized for securing this unit. Connect the capacitor lead to the terminal on the generator side of the cut-out switch. (In some cases, interference will be reduced by connecting the capacitor lead to the opposite side of the cut-out. The most suitable position for this lead must be determined by trial.)

(4) Clamp the other by-pass capacitor securely to the instrument panel (if metallic) or to a convenient portion of the metal frame of the car, and connect the capacitor lead to the battery side of the ammeter (usually the terminal with only one lead). In certain cases, interference will be reduced by connecting the lead of this capacitor to the battery side of the ignition coil instead of to the ammeter.

(5) It may be found necessary to secure the loudspeaker cable beneath the grounding clamp (packed in Outfit Package) in order to minimize ignition interference. This clamp (as shown in Figure 1) may be attached conveniently to the left side of the receiver container.

PART II—OPERATION

The instrument should be operated as follows:

1. Insert the key in the lock on the Control Unit and turn it to the "on" position clockwise.

2. Set the Volume Control (left-hand knob) at or near the extreme clockwise position. Then turn the Station Selector (right-hand knob) in either direction until a station is heard. (Note—The dial scale is calibrated in channels to aid in station identification. Add one cipher to the scale marking to obtain the actual frequency in kilocycles.)

3. After receiving a signal, turn the Volume Control counter-clockwise until the volume is reduced to a low level. Now, re-adjust the Station Selector to the position midway between the points where the quality becomes poor or the signal disappears. ***This operation insures the best quality of reproduction.***

4. Finally, advance the Volume Control (clockwise) until the desired level is obtained. Except on weak signals, the automatic volume control will maintain the volume substantially at the latter level, thereby precluding further manual adjustments. (Fading of the signal may be experienced in extreme cases, as when passing under bridges or other metallic structures, since such structures almost completely shield the antenna.)

5. When through operating, turn the key to the "off" position, counter-clockwise. The instrument is then locked by removing the key.

PART III — MAINTENANCE

Noisy or weak reception may be due to one of the following causes:

Radiotrons—The Radiotrons should be tested periodically and replaced if necessary in order to maintain best performance. The efficiency of each Radiotron may be checked by comparison with a new one of the same type in its place. Spare Radiotrons of each type should be kept on hand.

Fuses—This installation is protected by one fuse (rated: 10 amperes) which is mounted in clips accessible from the rear of the control box. If the set fails to operate and the dial lamp does not light, this fuse should be removed for examination. If found to be burned out, the wiring should be inspected for short-circuits or grounds and all tubes tested prior to insertion of a new fuse. ***The replacement fuse must be of the same ampere rating.***

"B" Battery Eliminator—This unit should operate satisfactorily with little or no attention. ***Under no condition should this machine be oiled.*** Any adjustments or servicing required should be undertaken only by a competent technician—preferably by your Dealer's Service Man.

Antenna—A properly installed roof antenna should require no attention. When the plate antenna is employed, the insulator bushings should be cleaned occasionally to prevent grounding.

Ignition System of Automobile—The ignition system of the car must be kept in good condition. Fouled plugs or plugs with improperly adjusted gaps will affect the operation of the receiver as well as the automobile. Burned or improperly adjusted breaker points will also impair the performance. It will be advisable to advance the generator charging rate in order to compensate for the additional drain on the car storage battery imposed by this instrument.

APPENDIX I—"B" BATTERY OPERATED MODEL

As noted in the Introductory section, a special instrument is available for "B" battery operation. This receiver is identical to the standard model except that the "B" Battery Eliminator Unit is omitted and a specially designed interconnecting cable is used. For such operation, four 45 volt "B" batteries are required and may be obtained from your Dealer.

The following parts are furnished as standard equipment with the battery operated receiver:

1 Fuse (rated 0.50 amp.)

2 Fuse Leads (with clips)

1 Fuse Insulation Sleeve

3 Battery Jumper Wires

Certain body types, such as coupes or sedans, afford sufficient space to permit internal mounting of the batteries. In these cases, it is necessary only to clamp the units in a manner to prevent injury or grounding through undue motion while the car is in operation. In such installations, the batteries will probably be most conveniently stacked "end to end" as shown in Figure 3.

For other installations, a special battery box for external mounting (also available from your Dealer) will probably be found necessary or desirable. This box (as shown in Figure 1) may be located at any position under the floorboards of the vehicle except near the exhaust line or where interference with free-moving parts of the chassis will be encountered. If placed in close proximity to the exhaust pipe or muffler, the heat radiation therefrom will cause rapid

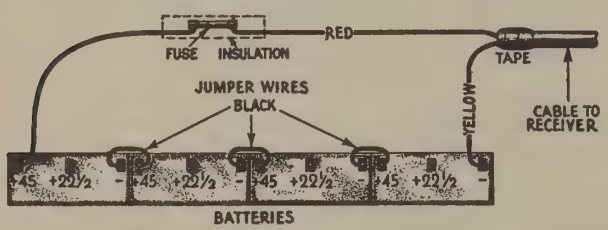


Figure 3

deterioration of the batteries. The box is of suitable dimensions to accommodate the following types of "B" batteries:

Eveready—No. 485, No. 772, No. 796

Burgess—No. 2305, No. 2308, D-308

General—"Flying Squad" V 30 DX

If the battery box is used, it may be mounted most conveniently by drilling the required four (4) three-eighths inch holes in the floorboard with the box cover serving as a template. Insert the four carriage bolts from above and fasten the box cover (with the hanger bolts inserted) in position beneath the floorboard with the nuts and lockwashers provided. Place the "B" batteries in the box and make all necessary internal connections (see Figure 4). With the fibre spacers in position above the batteries and the nuts on the hanger bolts unscrewed to the ends, lift the battery box into place, swing the hanger bolts into the case brackets and tighten all nuts. Make certain that both nuts are on each bolt and locked tightly. These operations, naturally, will be facilitated by placing the car on a lift.

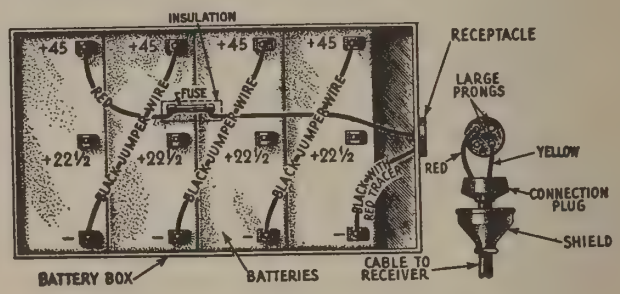


Figure 4

With the battery operated receiver, it will be noted that a plate circuit fuse must be employed. If the cable is to be connected directly to the batteries, the metal braid on the outside of the cable must be pushed back for a short distance in order to obtain leads of suitable length. As indicated in Figure 3, one fuse lead must be soldered to the cable wire and taped and the other connected to the end battery. The leads are equipped with clips (to permit ready replacement of the fuse) which in assembly are protected by an insulation sleeve. The end of the cable should be wrapped with tape for a short distance in order to prevent fraying and grounding to the battery terminals.

If the battery box is used, slip the rubber cover and the plug cap over the cable and solder the leads into the connection plug as indicated in Figure 4. Then fasten the cap to the plug, push the rubber cover forward and insert in the receptacle. One of the fuse leads must be connected to the proper terminal of the receptacle and the other to the end battery.

Worn out "B" batteries cause noisy and weak reception. Renew the batteries when they fail to give a reading of at least 35 volts per block as indicated by a high resistance voltmeter with the set turned "on."

APPENDIX II—SERVICE DATA

Electrical Specifications

Radiotrons Required
1 RCA-237, 3 RCA-239, 1 RCA-85, 1 RCA-89, Total—6

"A" Battery Consumption—Loudspeaker.....1.35 Amperes
Receiver.....2.15 Amperes
Converter.....3.0 Amperes

Plate Power Consumption.....35 M. A.
Undistorted Output.....1.25 Watts
Intermediate Frequency.....175 K. C.
R. F. Line-up Frequency.....1400 K. C.
Oscillator Line-Up Frequency.....1400 Only

This six tube automobile receiver gives excellent performance in respect to sensitivity, selectivity and tone quality. When used with the converter unit, operation entirely from the car battery is obtained.

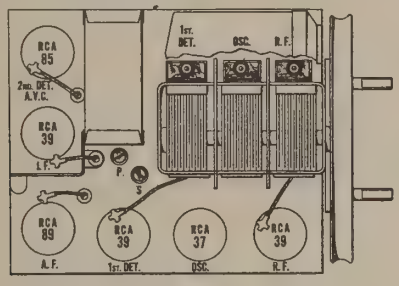


Figure A—Location of Radiotrons and Line-up Capacitors

Line-up Capacitor Adjustments

The receiver must be removed from its metal case to permit correct adjustment of the line-up capacitors. After being removed, a grounded metal plate must be provided for the receiver to rest upon, otherwise the adjustments will be found to be incorrect when the assembly is returned to its metal case. After removal from its case and placing upon the metal plate, proceed as follows:

I. F. Line-up Capacitor Adjustment—The I. F. Amplifier uses two transformers, one being of the untuned variety and one having each of its windings tuned by means of two adjustable capacitors. Figure A shows the location of these capacitors.

(a) Procure a modulated oscillator giving a signal at 175 K. C. and having its output adjustable. A non-metallic screwdriver such as Stock No. 7065 is necessary together with an output meter.

(b) Remove the receiver from its case, place it in operation and connect the output of the oscillator between the control grid and ground of the first detector. Remove the oscillator tube and connect the output meter—preferably a thermo-galvanometer—across the voice coil of the loudspeaker. Then with the volume control at maximum, reduce the oscillator output until a small indication is obtained. Unless this is done, the action of the A. V. C. will make it impossible to obtain correct adjustments.

(c) Adjust the secondary and then the primary of the I. F. transformer until a maximum deflection is obtained in the output meter. This is the correct adjustment.

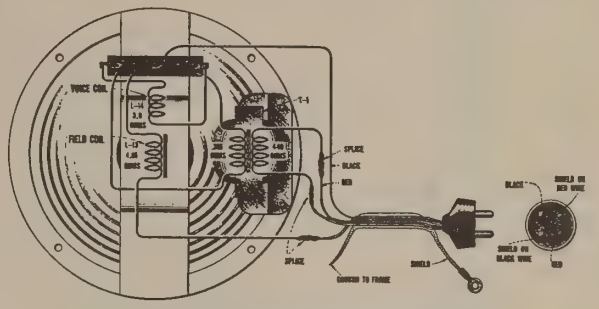


Figure B—Loudspeaker Wiring Diagram

R. F. Line-up Capacitor Adjustment—The R. F., 1st detector and oscillator stages are aligned at 1400 K. C. A modulated oscillator giving a signal at 1400 K. C. a socket wrench and an output meter are necessary for correctly making these adjustments.

(a) Remove the receiver from its metal case and place on a grounded metal plate. Connect the tuning control and place in operation. Connect the output of the oscillator between antenna and ground. Connect the output meter across the voice coil of the loudspeaker.

(b) Place the oscillator in operation at 1400 K. C. and adjust its output so that a small deflection is obtained when the receiver volume control is at maximum and the dial set at 1400. Then adjust the three line-up capacitors until a maximum deflection is obtained. This is done by means of a socket wrench.

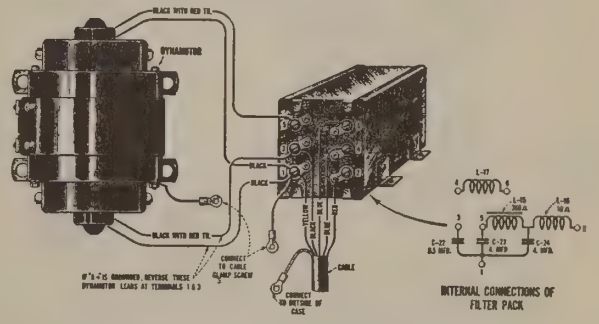


Figure C—Plate Supply Unit Wiring

RADIOTRON SOCKET VOLTAGES

Radiotron No.	Cathode or Filament to Control Grid Volts	Cathode or Filament to Screen Grid Volts	Cathode or Filament to Plate Volts	Plate Current M. A.	Filament or Heater Volts
1. R.F. RCA-39	0.9	71	177	4.5	5.2
2. 1st Det. RCA-39	6.0	67	172	1.35	5.2
3. Osc. RCA-37	—	—	72	5.5	5.2
4. I.F. RCA-39	0.9	71	177	4.5	5.2
5. 2nd Det. and A.V.C. RCA-85	—	—	175	4.5	5.2
6. PWR. RCA-89	18	178	160	18.0	5.2

Voltages are those at which Radiotrons are operating and with no signal impressed on input.

OTHER IMPORTANT VOLTAGES

Battery Voltage.....6.0 Volts
Input to Dynamotor.....5.75 Volts
Battery Drain.....6.5 Amperes
Output from Dynamotor.....178 Volts at 34.5 M.A.
Loudspeaker Field Drain.....1.35 Amperes

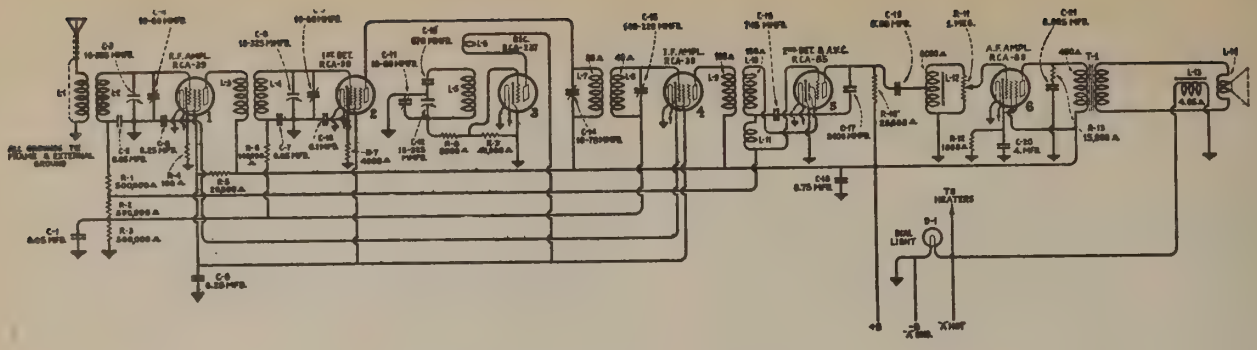


Figure D—Schematic Wiring Diagram

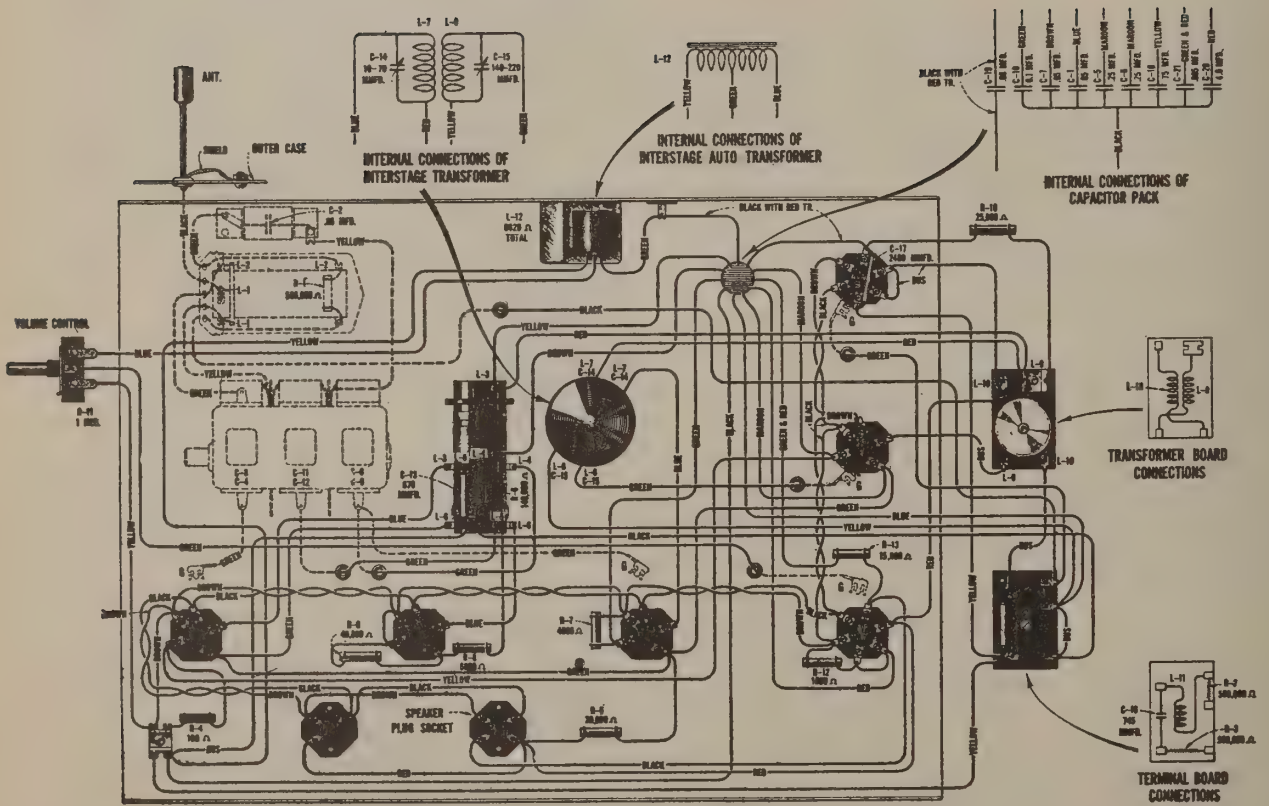


Figure E—Receiver Wiring Diagram

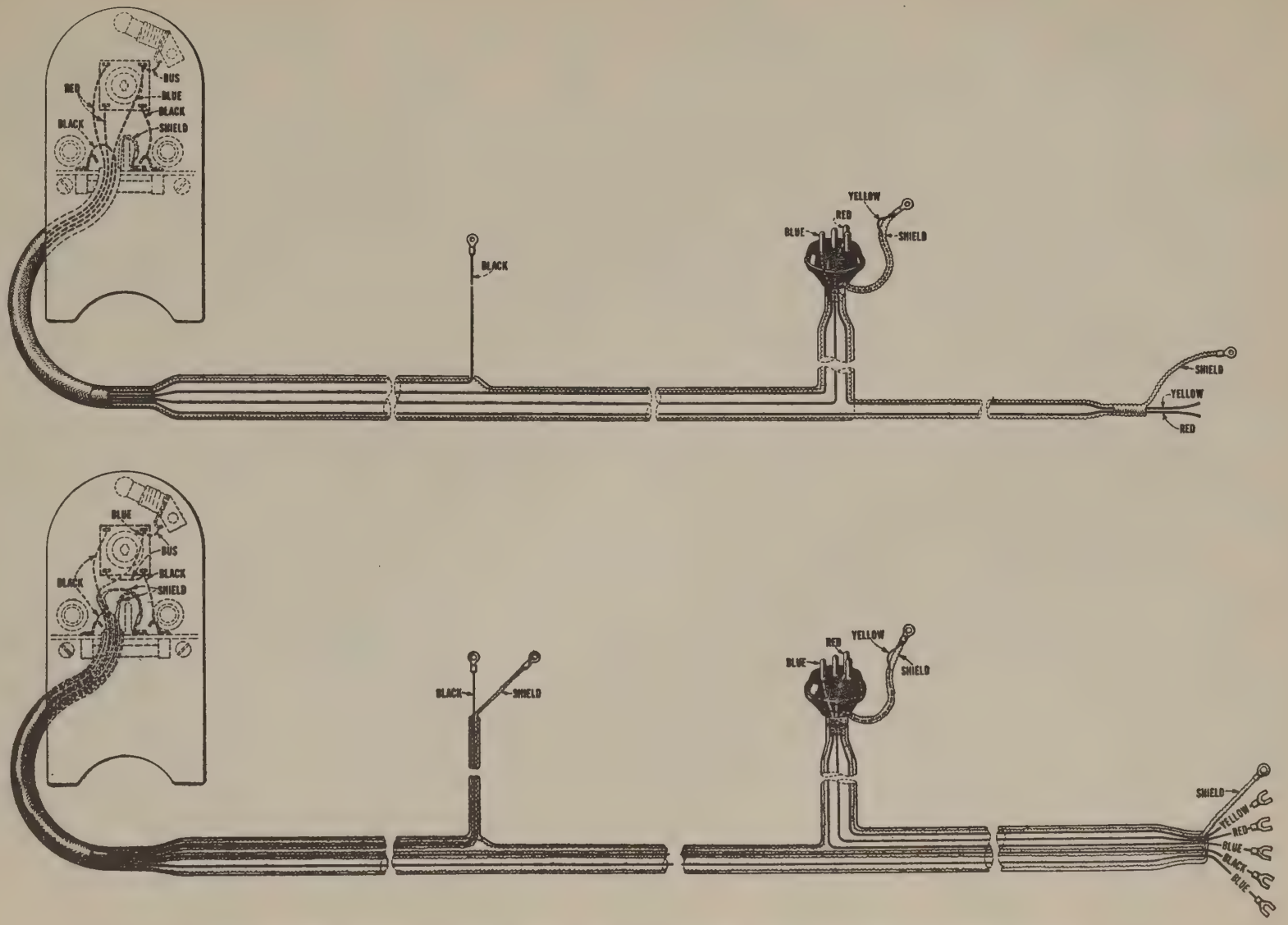


Figure F—Wiring Diagram of Control Box and Cables (top for Battery Model and bottom for Dynamotor Model)

REPLACEMENT PARTS

(Replacement parts may be purchased from authorized Distributors or Dealers Only)

Stock No.	DESCRIPTION	List Price
	RECEIVER ASSEMBLIES	
2734	Capacitor—745 mmfd.—Package of 5	$2.20
2747	Contact cap—Package of 5	.50
2749	Capacitor—2,400 mmfd.	1.50
2816	Resistor — 1,000 ohm — Carbon type — ½ watt—Package of 5	2.50
3264	Resistor—25,000 ohms—Carbon type—½ watt—Package of 5	2.00
3442	Resistor—100 ohms—Carbon type—¼ watt —Package of 5	1.00
3443	Resistor—140 ohms—Carbon type—¼ watt —Package of 5	1.00
3447	Coil—Automatic volume control coupling coil	.66
3448	Cord—3 gang tuning capacitor drive cord	.50
3454	Scale—Dial Scale	.54
6114	Resistor — 20,000 ohms — Carbon type — 1 watt—Package of 5	2.00
6143	Resistor—40,000 ohms—Carbon type—¼ watt—Package of 5	2.00
6186	Resistor—500,000 ohms—Carbon type—¼ watt—Package of 5	2.00
6192	Spring—3 gang tuning capacitor drive cord tension spring—Package of 10	.50
6241	Resistor—140,000 ohms—Carbon type—¼ watt—Package of 5	2.00
6243	Resistor — 6,000 ohms — Carbon type — ¼ watt—Package of 5	2.00
6250	Resistor — 4,000 ohms — Carbon type — ½ watt—Package of 5	2.00
6300	Socket—4 contact Radiotron socket	.55
6317	Capacitor—0.05 mfd. capacitor	.70
6320	Capacitor—670 mmfd.—Oscillator series capacitor—Package of 5	2.50
6358	Socket—3 contact socket	.38
6359	Shield—Radiotron tube shield	.36
6360	Transformer—First intermediate frequency transformer	2.14
6361	Transformer — Second intermediate frequency transformer	2.28
6362	Shaft—Tuning capacitor drive shaft with two "C" washers	.40
6363	Volume control-Complete with mounting nut	1.38
6365	Coil—Detector and oscillator coil	2.32
6366	Coil—R. F. coil assembly	1.60
7484	Socket—UY type Radiotron socket	.65
7485	Socket—Radiotron 6 contact socket	.70
7545	Transformer—Interstage auto transformer	2.48
7546	Capacitor pack—Comprising one 0.08 mfd., one 0.1 mfd., two 0.05 mfd., two 0.25 mfd., one 0.75 mfd., one 0.005 mfd., and one 4.0 mfd. capacitors in metal container	3.58
7547	Drum—For 3 gang tuning capacitor	.70
7548	Capacitor—3 gang variable tuning capacitor assembly	3.50
	CONTROL BOX ASSEMBLIES	
3444	Socket—Dial lamp socket	.38
3445	Shaft—Volume control shaft with "C" washer	.48
3446	Shaft—Station selector shaft with "C" washer	.38
3454	Scale—Dial scale	.54
6158	Nut—Knurled nut for lock switch—Pkg. of 10	.50
6161	Knob—Station selector knob—Package of 5	1.50
6163	Knob—Volume control knob—Package of 5	1.50
6164	Key—For lock switch—Package of 10	.50
6357	Switch—Lock switch complete	1.46
7543	Shaft — Flexible shaft — Volume control or station selector shaft—Approx. 27" long	1.92
7544	Cover—Control box cover assembly comprising cover, cover mounting screws, mounting clamp and clamp mounting screws	.76
7562	Shaft—Volume control or station selector flexible shaft—Approximately 39" long	1.62
7563	Shaft—Volume control or station selector flexible shaft—Approximately 51" long	1.94

Stock No.	DESCRIPTION	List Price
	ANTENNA ASSEMBLY	
3465	Cable—Antenna lead-in shielded cable	$0.35
3466	Connector—Antenna lead-in connector	.60
3491	Washer—Rubber insulating washer—Used with insulator No. 6131—Package of 4	.25
6129	Staple—Insulated staple—Package of 100	.75
6130	Screw and nut—U bracket set screw—¼—16 x 1—Complete with lock nut—Pkg. of 10	.50
6131	Insulator—Insulator bushing for No. 7420—Package of 10	.70
6381	Cable—Shielded antenna cable—For use with antenna plate	2.94
7419	Bracket—U bracket for mounting antenna plates—Package of 2	1.60
7420	Stud—Antenna plate stud—¼—16 x 8"—Complete with 5 mounting nuts—Pkg. of 5	1.90
8819	Plate—Single antenna plate	1.75
	MISCELLANEOUS PARTS	
6148	Fuse—10 amperes—Package of 5	.50
6151	Suppressor—Spark plug suppressor	.65
6152	Suppressor—Distributor suppressor	.65
6169	Felt—Felt strip for steering column—Pk. of 10	.50
7065	Screwdriver—Non metallic Screwdriver—For line-up adjustments	1.10
7429	Capacitor—0.625 mfd. capacitor in metal casing with mounting bracket	2.20
7553	Cable—Inter-connecting cable complete with male section of connector plug—For eliminator operation	2.66
7561	Cable—Inter-connecting cable complete with male section of connector plug—For battery operation	2.12
	REPRODUCER ASSEMBLIES	
6182	Terminal board—Reproducer terminal board with 3 terminals—Package of 5	.50
6364	Transformer—Output transformer	2.00
8702	Ring—Cone retaining ring	.80
8961	Coil assembly—Comprising field coil, magnet and cone support	3.34
8962	Cone—Reproducer cone	1.12
8963	Bracket — Reproducer mounting bracket complete with washer and nuts	.98
8964	Housing—Reproducer housing	2.08
8965	Screen—Dust screen	.40
	BATTERY BOX ASSEMBLY	
2968	Receptacle—Four prong receptacle complete	.50
6122	Clamp—Cable clamp—Package of 15	.50
6123	Plug—Four prong male plug	.50
6124	Cap—Plug cover rubber cap for #6123-Pk. of 5	1.50
6125	Fuse—¼ ampere—Package of 5	.50
6126	Clip—Fuse clip—Package of 12	.50
6127	Bolt—Carriage bolt for mounting top of box to car—¼—18 x 1¼"—Complete with lock nut—Package of 5	.50
7418	Bolt—Hanger bolt ¼—18 x 9½"—Complete with two lock nuts—Package of 5	.50
8817	Box body assembly—Comprising bottom plate, 2 side plates, 2 bottom strips and receptacle—Assembled	3.45
8818	Box cover assembly—Comprising cover plate, 2 strips and 2 rubber strips—Assembled	1.70
8820	Plate and strip assembly—Carboard plate and strip assembly comprising six strips and one plate—Package of 5 sets	.75
	"B" ELIMINATOR ASSEMBLIES	
3473	Brushes—One set of 2—For low voltage end of dynamotor	1.04
3474	Brushes—One set of 2—For high voltage end of dynamotor	.82
7554	Filter pack—Comprising one 0.5 mfd., two 4.0 mfd. capacitors, one reactor and two choke coils	4.87
7555	Dynamotor complete	23.52

.0527

23128
S. O. 759907—1M

Printed in U. S. A.

Service Notes for

RCA Victor Portable Turntable PT-33

ELECTRICAL SPECIFICATIONS

Voltage Rating.....105–125 Volts
Frequency Rating.....25, 30, 50 and 60 Cycles
Power Consumption..... 25° 30 Watts, 30° 33 Watts, 50° 32 Watts, 60° 30 Watts
Type of Magnetic Pickup.....Low Impedance
Type of Tone Arm.....Straight
Diameter of Turntable.....12 inches

PHYSICAL SPECIFICATIONS

Height.....9⅛ inches
Depth.....13½ inches
Width.....18¼ inches
Weight Alone.....25 lbs.
Weight Packed for Shipment.....32 lbs.

RCA Victor Portable Turntable PT-33 is a portable two-speed turntable combined with a magnetic pickup, tone compensator and input transformer which may be used in conjunction with modern radio receivers to play either Standard or Program Transcription Records.

The instruction for connecting this instrument to various RCA-Victor receivers are included with each instrument. Service data pertaining to the magnetic pickup, speed reducer and phonograph motor is contained in previous Service Notes already issued on instruments using the similar units. The schematic and wiring diagrams are shown on the following pages and the replacement parts are listed below.

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
	MOTOR BOARD ASSEMBLY	
X-53	Motor board	$3.50
2614	Switch—Automatic brake switch	1.40
2620	Cushions—Pickup rubber cushions comprising 2 pivots and 1 damper cushion—Package of 5 sets	1.25
2765	Screw—Pickup needle holding screw—Package of 10	.80
2766	Screw—Pickup cover mounting screw—Package of 10	.50
2767	Spring—Pickup magnet retaining spring—Package of 10	.50
2768	Armature—Pickup armature	.50
2769	Coil—Pickup coil	.50
2770	Plate—Pickup damper plate complete—Package of 5	.50
2771	Screw—Pickup damper plate mounting screw—Package of 10	.50
2828	Screw assembly — Pickup mounting screw nut and washer—Package of 10 sets	.60
2870	Resistor—600 ohms—Carbon type—¼ watt—For control panel—Package of 5	1.50
2871	Resistor—5,000 ohms—Carbon type—¼ watt—For control panel—Package of 5	1.50
2875	Knob—Record volume control knob—Package of 5	1.50
2878	Cable—Control board cable	1.30
2879	Adapter—Special adapter to connect control board to detector tube—Package of 5	$1.00
2908	Spring—Pawl carrier spring—Package of 10	.50
3052	Screw assembly—Pickup pole shoe mounting screw, nut and washer—Package of 10 sets	.50
3157	Gear—Driving gear—Located on turntable spindle above top plate	1.00
3159	Friction brake—Gear reducing friction brake spring with pad—Complete with mounting rivet—Package of 4	2.00
3160	Escutcheon—Speed escutcheon plate with mounting screws—Package of 2	.90
3161	Spring—Shift lever spring—Package of 5	1.20
3167	Magnet—Pickup magnet	2.60
3169	Pole shoe—R. H. pole shoe	1.45
3170	Pole shoe—L. H. pole shoe	1.45
3211	Washer — Turntable spindle leather washer—Package of 10	.50
3212	Spring — Turntable spindle plunger spring—Package of 10	.50
3278	Bearing—Rotor shaft fibre thrust bearing and cork button—Package of 10	.50
3279	Screw and nut—Rotor shaft thrust bearing adjusting screw and locknut—Package of 10	.50
3280	Washer—Metal washer—Located on turntable spindle underneath gear reducing unit—Package of 20	.50

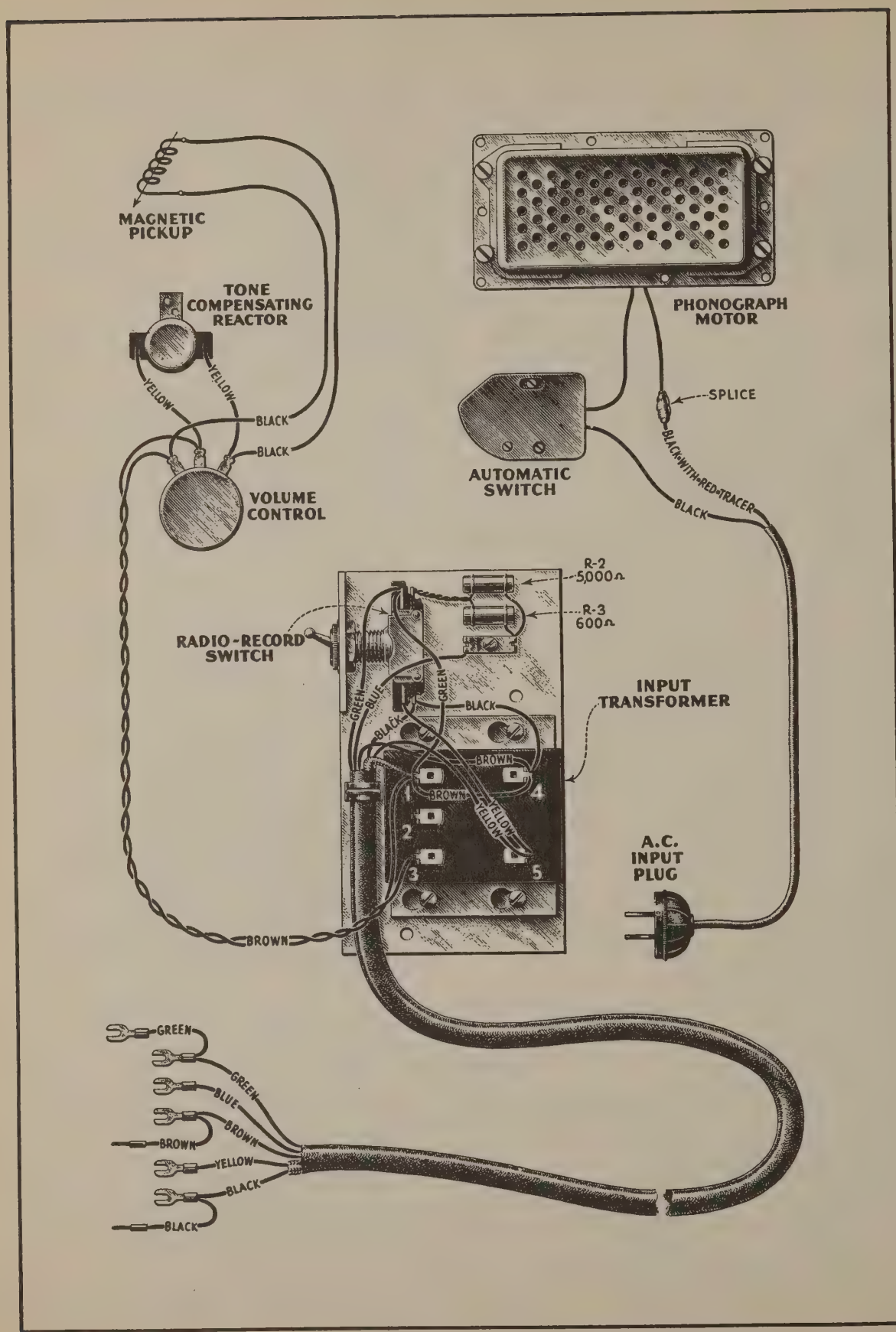


Figure 1—Assembly Wiring

REPLACEMENT PARTS (Continued)

Stock No.	DESCRIPTION	List Price
3281	Pawl—Gear reducing pawl with mounting stud	$ .50
6119	Stud—Motor hanging stud—Package of 6	.50
6120	Screw—For holding turntable spindle bearing and grease cap—Package of 10	.50
6121	Bearing—Turntable spindle bearing and grease cap	1.10
6196	Switch—Radio record switch complete with mounting nuts and escutcheon plate	.90
6197	Trip rod—Automatic brake trip rod with lock nut—Package of 10	.50
6198	Screw and nut—Pickup arm height adjusing screw and lock nut—Package of 20	.50
7054	Cable—Motor power cable with plug	1.00
7084	Turntable covering	.50
7093	Cover—Pickup cover	.50
7151	Back—Pickup housing back	.50
7180	Brake—Automatic brake complete	3.40
7305	Gear—Gear reducing unit complete	4.50
7387	Reactor—Tone compensating reactor with mounting bracket	.85
7388	Spindle—Turntable spindle with fibre gear—60 cycles	6.00
7389	Rotor and shaft—60 cycles	9.00
7390	Motor mounting washers and springs—Comprising 3 "C" washers, 9 cup washers and 6 springs—Package of 1 set	.75
7391	Volume control—Record volume control complete with mounting nut and washer	1.35
7394	Pickup—Pickup unit complete	12.50
7400	Spindle—Turntable spindle with fibre gear—25 cycles	8.00
7401	Rotor and shaft—25 cycles	10.00
7402	Spindle—Turntable spindle with fibre gear—30 cycles	8.00
7403	Rotor and shaft	10.00
7443	Rotor and shaft—50 cycles	$9.00
7444	Spindle—Turntable spindle with fibre gear—50 cycles	6.00
7445	Transformer—Input transformer	4.55
7446	Cable—Twisted twin conductor cable from volume control to input transformer	.60
8733	Turntable—Turntable with cover	4.60
8795	Motor—Motor complete—110 volts—60 cycles	19.85
8800	Motor—Motor complete—110 volts—25 cycles	24.65
8801	Motor—Motor complete—110 volts—30 cycles	24.65
8856	Motor—Motor complete—110 volts—50 cycles	19.85
8857	Control board assembly—Complete—Comprising board, switch plate, input transformer, switch, resistors and cable	6.60
8858	Arm—Pickup arm complete—Less pickup unit	4.65
10174	Spring—Automatic brake springs—Set of 4—Package of 2 sets	.50
10184	Plate—Automatic brake trip plate with mounting screws—Package of 5	.60
10524	Connector block — Pickup connector block and wire	.50
	CABINET ASSEMBLY	
6113	Foot—Felt foot—Package of 15	.50
6199	Cushion—Lid felt cushion—Package of 40	.50
6200	Hinge—Cabinet lid hinge complete with mounting screws—Package of 8	.65
6201	Label—Metal trade mark label—Package of 5	.50
9406	Cabinet—Cabinet complete less equipment	20.25
10125	Support—Lid support	.75
10688	Screw and washer—Motor board mounting screw and washer—Package of 10	.50

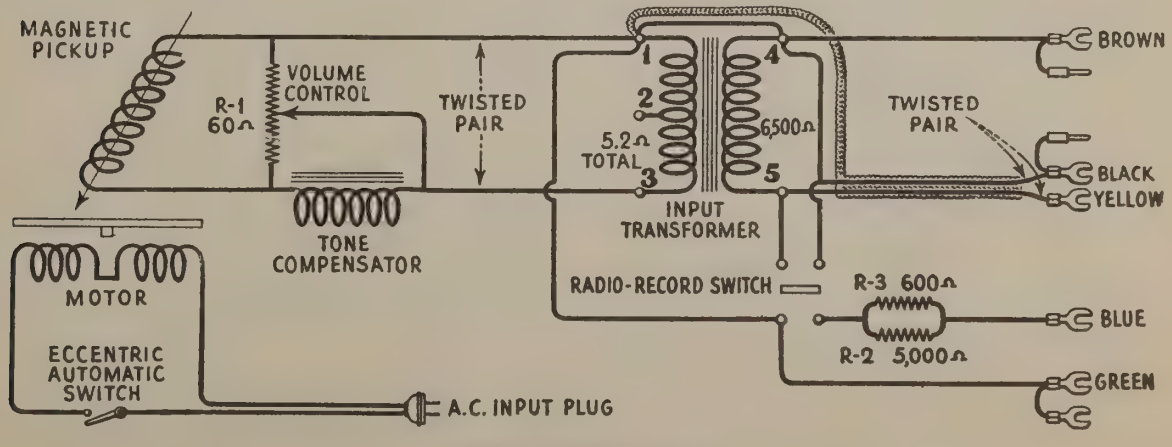


Figure 2—Schematic Circuit

SERVICE DIVISION

RCA Victor Company, Inc.

Camden, N. J., U. S. A.

S. O. 8913 5M 2-12-'32

SERVICE NOTES

for

RCA Victor Console, R-43

The RCA Victor Console, R-43 is an eight tube screen grid battery operated Super-Heterodyne radio receiver.

Three Radiotrons RCA-232 are used in the R.F., 1st detector and I.F. stages respectively. Five Radiotrons RCA-230 are used in the Oscillator, 2nd detector, 1st audio and push-pull power stage.

A reference to the RCA Victor Radiola Superette Service Notes will give the details of circuit operation up to and including the second detector. The audio circuits of the R-43 are however, considerably different from the R-7. A discussion of their function follows:

The first audio stage operates in the usual manner, its output being fed into the grid circuit of the push-pull stage. The output stage is of the push-pull type, in which the tubes are biased to substantially plate current cut-off. The arrangement is such that the output stage may deliver substantially four times the output that would be obtained with the same tubes operated in the usual circuit. This system is very economical due to there being but a small amount of residual plate current flowing in the output stage. Current is drawn only when a modulated signal is being received.

An extra winding, shunted by a capacitor, is placed on the output transformer. The purpose of this circuit is to provide a high frequency cut-off for the audio amplifier.

A tone control is provided, which consists of a 0.1 mfd. capacitor and a 50,000 Ohm variable resistor connected across one half of the secondary of the input transformer. This circuit functions to reduce the high frequency output as the resistance is decreased.

The permanent magnet dynamic loudspeaker used with this receiver is a new development and gives all the fine quality and life-like reproduction inherent in this type of reproducer.

The receiver is designed for use with the new Eveready Aircell "A" battery which provides a life in excess of 600 ampere hours. The receiver draws but .48 amperes, giving approximately 1200 hours life from a single filament battery.

The plate and grid supply for all Radiotrons is furnished from four heavy duty "B" batteries. Due to the low current drain—8 to 15 M.A.—excellent life is obtained from this source of current.

SERVICE DATA

A reference to the RCA Victor Superette, R-7 Service Notes will give complete details on R.F., oscillator and I.F. adjustments as well as the usual service information required with this type of receiver.

BATTERIES

The Eveready Aircell "A" battery must be kept clean and the plates covered with water at all times. Operation at temperatures of 40 degrees Fahrenheit or lower is not recommended and if attempted will result in damage to the battery. Having the battery idle at this temperature does not in any way affect it. If it is essential that an installation be made where the receiver is to be operated at 40 degrees Fahrenheit or less, a single cell storage battery should be used. Due to the low current drain, excellent life from one charging will be obtained.

"B" batteries should be replaced when their output voltage has dropped 25% under load.

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
	RECEIVER ASSEMBLY	
2012	Capacitor—1200 Mmfd.	$0.55
2563	Resistor—6000 Ohms—Carbon type—Package of 5	3.00
2747	Cap—Radiotron grid contact cap—Package of 5	.50
2749	Capacitor—2400 Mmfd.—Mica type	1.50
2875	Knob—Station selector, tone control or volume control knob—Package of 5	1.50
2957	Capacitor—10 Mfd.—Electrolytic type	3.00
2968	Socket—UX Radiotron socket complete with insulating shield—2 hole mounting—3 used	.50
2993	Board—Resistor mounting board—Less resistor and coil	1.00
2994	Coil—2nd detector R.F. coil complete with rivet	.60
2998	Coil—Detector and oscillator coil—Complete with mounting washers and nuts	2.40
2999	Shaft—Dial drive shaft—Complete with mounting screws and lock washers	.50
3000	Scale—Dial drum and scale complete with set screws	.60
3003	Cushion—Sponge rubber cushion—Package of 4	.50
3032	Socket—UX Radiotron socket complete with insulating shield—three hole mounting—5 used	.50
3033	Resistor—1 megohm—Carbon type—Package of 5	2.00
3034	Resistor—180,000 Ohms—Carbon type—Package of 5	2.50
3035	Resistor—1300 Ohms—Carbon type—Package of 5	2.50
3036	Resistor—29,000 Ohms—Carbon type—Package of 5	2.50
3037	Resistor—650 Ohms—Carbon type—Package of 5	2.50
3038	Resistor—350,000 Ohms—Carbon type—Package of 5	2.50
3039	Resistor—270,000 Ohms—Carbon type—Package of 5	2.50
3040	Capacitor—.0025 Mfd.—Paper type	.50
3041	Board—Capacitor and resistor mounting board—Less resistor and capacitor	.50
3042	Capacitor—0.1 Mfd.—Paper type	.70
3043	Resistor—0.8 Ohms—Wire wound	.50
3044	Resistor—4000 Ohms—Carbon type—Package of 5	2.50
3045	Resistor—40,000 Ohms—Carbon type—Package of 5	2.50
3056	Shield—Radiotron shield—Package of 2—3 used	.50
3086	Switch—Local distant switch	.80
3087	Switch—Operating switch	1.60
3088	Knob—Operating switch or local distant switch knob—Package of 5	.50
7062	Capacitor—Adjustable oscillator trimming capacitor	$1.00
7241	Capacitor—3 Gang tuning capacitor complete with mounting screws and washers	8.00
7260	Tone or Volume Control—Complete less knob	1.50
7261	Coil—R.F. Coil complete with mounting washer and nut	1.70
7262	Transformer—1st Intermediate transformer—Complete with shield and mounting screws	3.00
7263	Transformer—2nd Intermediate transformer—Complete with shield and mounting screws	3.00
7264	Capacitor Pack—R.F. by-pass capacitor in metal container	3.50
7265	Transformer—Interstage Audio transformer in metal container	4.50
9354	Chassis—Receiver chassis complete—Less all Radiotrons	40.00
	REPRODUCER ASSEMBLY	
8559	Ring—Cone retaining ring	.80
8601	Cone—Reproducer cone complete with voice coil—Package of 5	15.00
9355	Speaker—Loudspeaker complete	13.50
	CABINET ASSEMBLY	
3020	Escutcheon—Station selector escutcheon complete with mounting screws	.60
8585	Grille—Less grille cloth	2.00
8682	Board—Baffle board complete with grille cloth and baffle ring	1.50
8683	Post—R.H. Front post	3.00
8684	Post—R.H. Back post	3.00
8685	Post—L.H. Front post	3.00
8686	Post—L.H. Back post	3.00
8687	Stretcher	5.00
8688	Top—Cabinet top	6.50
8689	Foot—Cabinet foot	.60
8690	Panel—Control panel	5.00
9356	Cabinet—Cabinet complete less all equipment	47.50

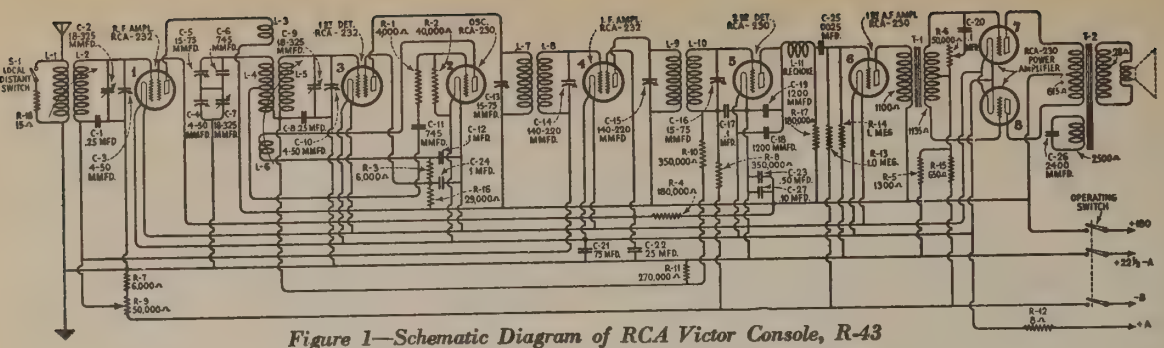


Figure 1—Schematic Diagram of RCA Victor Console, R-43

RADIOTRON SOCKET VOLTAGE

BATTERIES AT FULL VOLTAGE—NO SIGNAL BEING RECEIVED

These voltages are those obtained with one of the usual set analyzers. The values indicated, therefore, are not necessarily the voltages that actually appear at the Radiotron Sockets when the voltmeter is not connected.

Tube No.	Filament to Control Grid Volts	Filament to Screen Grid Volts	Filament to Plate Volts	Plate Current M. A.	Filament Volts
VOLUME CONTROL AT MINIMUM					
1	22	55	155	0	2.0
2	—	—	50	3.0	2.0
3	0.5	65	150	0.5	2.0
4	22	55	155	0	2.0
5	5.0	—	90	0	2.0
6	2.0	—	150	2.5	2.0
7	15.0	—	150	0.5	2.0
8	15.0		150	0.5	2.0
VOLUME CONTROL AT MAXIMUM					
1	1.5	45	150	2.5	2.0
2	—	—	50	3.0	2.0
3	0.5	60	150	0.5	2.0
4	1.5	45	150	2.5	2.0
5	5.0	—	90	0	2.0
6	2.0	—	150	2.5	2.0
7	15.0	—	150	0.5	2.0
8	15.0	—	150	0.5	2.0

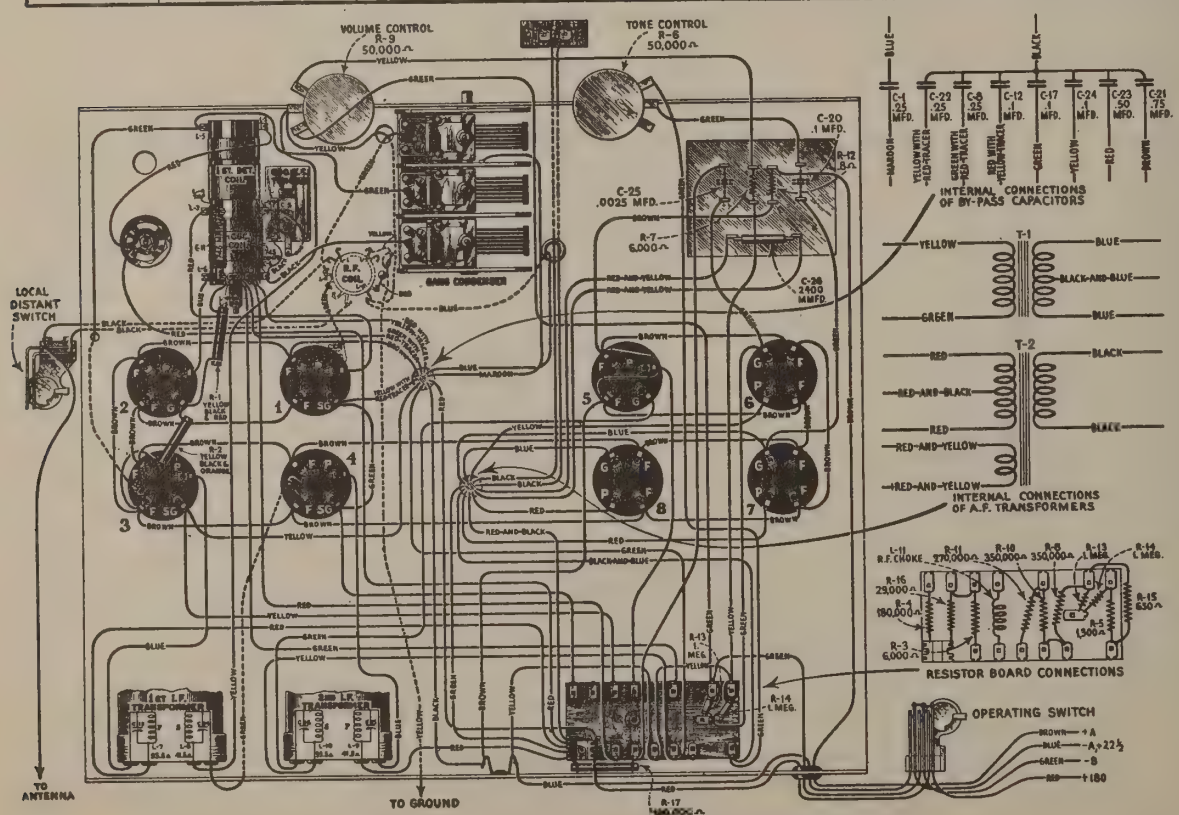


Figure 2—Wiring Diagram of RCA Victor Console, R-43

Service Division RCA Victor Company, Inc., Camden, N. J.

SERVICE NOTES

for

RCA Victor Radiolas R-50 and R-55

The RCA Victor Radiola R-50 and R-55 are ten tube screen grid automatic volume control Super-Heterodyne radio receivers. With the exception of the cabinets, both models are identical.

Features of these Models are: Super Control Screen Grid Radiotrons in the R. F. and I. F. stages, automatic volume control so arranged in the circuit to reduce noise between channels, push-pull Pentode output stage, accurately calibrated dial reading directly in kilocycles, totally shielded chassis and sensitivity, selectivity and fidelity superior to any previous RCA Victor receiver.

Referring to Figure 1 and tracing a signal through the various stages, we find the following action taking place.

The signal voltage, induced into the antenna system, is coupled by means of the antenna coil to the "link circuit." The link circuit tunes exactly with the tuned R. F. and first detector circuits. There is no gain in the circuit, it being merely a selection circuit.

A tuned R. F. stage follows which uses Radiotron RCA-235. The control grid bias for this tube is a function of the automatic volume control tube. The output is coupled inductively to the first detector grid circuit together with the output from the oscillator.

The first detector is tuned by one unit of the gang condenser. In its grid circuit, there is present the incoming signal and the oscillator signal, the latter being at a 175 K. C. difference from the former. The tube is biased so as to operate as a plate rectification detector and its purpose is to extract the difference or beat frequency, produced by combining the signal and oscillator frequencies. The beat frequency—175 K. C.—appears in the plate circuit of the first detector, which is accurately tuned to 175 K. C. The tube used as a first detector is Radiotron UY-224.

The next circuit is that of the first I. F. stage. It is a high gain Amplifier having both its grid and plate circuits tuned to 175 K. C. Its grid voltage is controlled by the automatic volume control tube.

At this point the automatic volume control tube should be considered, as its grid is controlled by the output from the first I. F. Stage.

The automatic volume control tube functions in the usual manner in that the signal voltage is applied to its grid and the voltage drop across a resistor in its plate circuit is the grid voltage applied to the R. F. and first I. F. amplifier. As the value of the plate current is a direct result of the signal voltage applied to the grid, a greater plate current gives a greater voltage drop across the resistor in its plate circuit and therefore a higher bias on the R. F. and I. F. stage. This results in less sensitivity, and vice versa. The signal output of the first I. F. stage is always maintained at a constant value.

The volume control should now be considered, as its position in the circuit has a large bearing on the quiet and smooth operation of the receiver.

In previous automatic volume control receivers, the volume control was placed in the grid circuit of the automatic volume control tube, its action being to vary the control grid voltage of this tube. When operating sets of this character, the receiver jumped to full sensitivity when not tuned to a signal and if in a noisy location, this noise was very objectionable.

In this instrument, however, the volume control is not in the automatic volume control tube circuit, but in the grid circuit of the second I. F. amplifier. By means of it the signal voltage applied to the second I. F. amplifier is controlled and under no conditions can noise or other signals exceed the level for which it has been set. Electrically, the primary and secondary of the second I. F. transformer are placed so that there is no transference of energy except by means of a small pickup coil. The volume control is a potentiometer shunted across this coil which determines the amount of pickup that will be used.

The second detector is a high-plate voltage, grid-biased type, using Radiotron UY-227, which gives sufficient output to drive two Radiotrons RCA-247 connected in push-pull without an intermediate audio stage. The purpose of the second detector is to extract the audio frequency component of the R. F. signal, which represents the voice or musical modulations produced in the studio of the broadcasting station. The audio component is extracted and used to drive the power tubes while the R. F. current is by-passed and not further used.

A grid filter consisting of a 1 megohm resistor in the second detector circuit helps to reduce any possible hum in this stage. The power A. F. Stage consists of two Radiotrons RCA-247 connected in push-pull.. Transformer coupling is used between the detector and the grids of the Radiotrons RCA-247 as well as from the plates to the cone coil of the reproducer unit.

A tone control, consisting of an inductor, .01 mfd. Capacitor and a 0.5 meg. variable resistor, is in the plate circuit of the second detector. The tone control functions to reduce the high frequency output as the resistance is reduced, without accentuating the bass response.

Two 0.0004 mfd. condensers, connected in series with their mid-point grounded, are connected across the secondary of the input transformer. The purpose of these condensers is to prevent audio oscillations and provide a high frequency audio cut-off.

A 0.005 mfd. condenser connected in series with an 18,000 ohm resistor is placed across the primary of the output transformer. This functions to reduce the third harmonic distortion, an inherent characteristic of the Pentode output tube. The direct plate and grid voltages are supplied from high voltage alternating current, which is rectified by means of Radiotron UX-280. The filter is of the tapped reactor type, which gives an output of well filtered D. C. The bias voltage of Radiotrons RCA-247 is obtained by using a portion of the drop across the reproducer field. One 100,000 and 20,000 ohm resistors act as the voltage dividing resistors.

SERVICE DATA

Information pertaining to R. F., Oscillator and I. F. adjustments, together with general service data for this type receiver, may be obtained from the Service Notes already issued on the RCA Radiola 80. Figure 1 shows the schematic diagram, Figure 2 the receiver assembly wiring and Figure 3 the magnetic pickup connections. Figure 4 shows the S. P. U. wiring and Figure 5 the assembly wiring. The voltage readings and replacement parts are shown on pages 2 and 3.

R. F. OSCILLATOR AND I. F. ADJUSTMENTS

A reference to the RCA Radiola 80 Notes will give the details for making correct R. F., I. F. and Oscillator adjustments. However, due to the use of an automatic volume control tube, its action will defeat the use of an output meter. To overcome this, a "dummy" Radiotron UY-227 (one that has one heater prong removed but is otherwise O. K.) should be substituted for the tube in the automatic volume control socket. Do not make any adjustments with this tube removed from the socket. While apparently everything functions in the normal manner, the lack of tube capacity in the circuits will cause an incorrect alignment to be made.

In the RCA Victor Radiola R-50 and R-55 the I. F. transformers are adjusted for maximum output and no attempt at band pass tuning should be made when these adjustments are made.

It will be noted on the early Models of R-50 and R-55 that a small 9 mmfd. capacitor is inserted in series with the oscillator trimming capacitor. This capacitor is not used on later models that have a slightly different dial scale. When replacing a dial scale it may therefore be necessary to short this capacitor. A failure in the capacitor may be remedied either by replacing the capacitor or the dial scale.

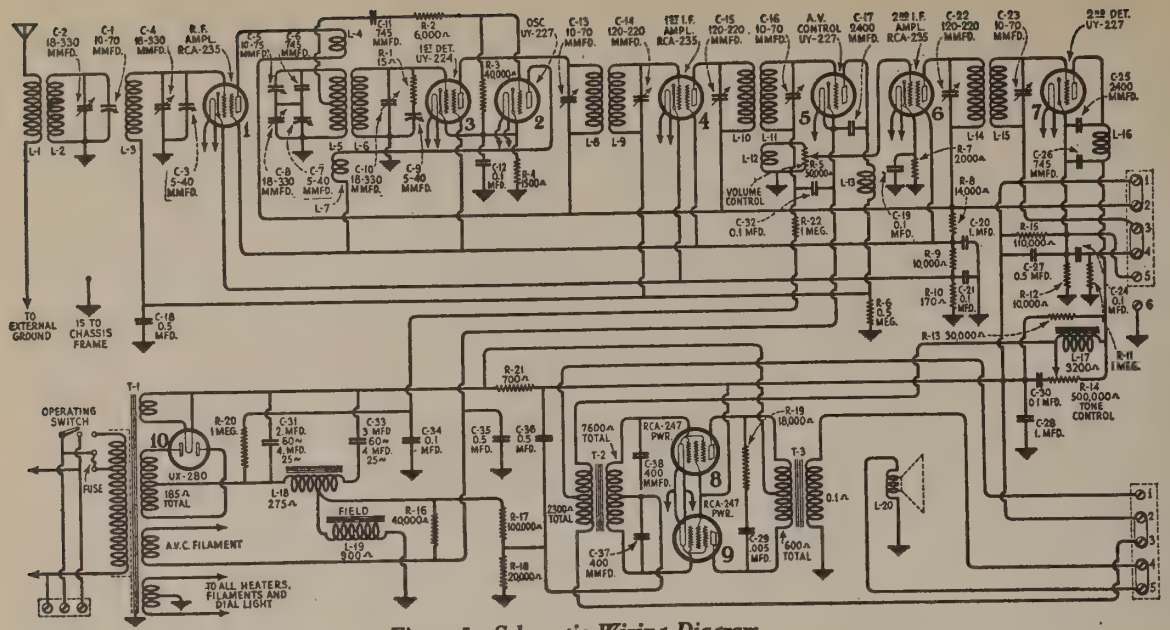


Figure 1—Schematic Wiring Diagram

REPLACEMENT PARTS

Insist on genuine factory tested parts, which are readily identified and may be purchased from authorized dealers

Stock No.	DESCRIPTION	List Price
	RECEIVER ASSEMBLY	
2563	Resistor—6,000 ohms—Carbon type—Package of 5	$1.10
2726	Socket—UY type Radiotron socket complete with shield (7 used)	.30
2731	Resistor—10,000 ohms—Carbon type—Package of 5.	1.10
2732	Resistor—110,000 ohms—Carbon type—Package of 5.	1.10
2734	Capacitor—745 mmfd.—Package of 5	1.50
2736	Resistor—170 ohms—Carbon type—Package of 5	1.10
2746	Socket—Dial lamp socket	.20
2747	Cap—Grid contactor cap—Package of 5	.50
2749	Capacitor—2,400 mmfd.	.35
2970	Resistor—500,000 ohms—Carbon type—Package of 5.	1.10
3031	Board—Terminal board complete with insulator—Three terminals	.35
3045	Resistor—40,000 ohms—Carbon type—Package of 5.	1.10
3050	Resistor—14,000 ohms—Carbon type	.25
3076	Resistor—1 megohm—Carbon type—Package of 5	1.00
3137	Knob—Station selector, volume control or tone control knob—Package of 5	2.40
3138	Board—Terminal board complete with soldering terminal	.35
3139	Coil—Oscillator and first detector coil complete with shield	2.65
3142	Volume control—Volume control complete with mounting nut	1.25
3143	Tone control—Tone control with mounting nut	1.20
3144	Inductor—Tone control inductor	1.20
3152	Resistor—30,000 ohms—Carbon type—Package of 5.	1.00
3153	Resistor—1,500 ohms—Carbon type—Package of 5.	1.10
3154	Resistor—2,000 ohms—Carbon type—Package of 5.	1.10
3219	Resistor—18,000 ohms—Carbon type—Package of 5.	1.00
3220	Resistor—15 ohms—Flexible type—Package of 5	1.00
3240	Nut—Removable Cover Mounting Nut—Package of 13	.50
6034	Cushion—Receiver chassis rubber cushion—Package of 4	1.20
7054	Cord—Power cord	.60
7062	Capacitor—Adjustable capacitor (2 used)	.50
7063	Capacitor—Adjustable capacitor (3 used)	.50
7278	Coil—R. F. and link circuit coil	1.60
7279	Support—Dial screen support	.35
7280	Board—Terminal board complete with six terminals.	.40
7281	Transformer—First intermediate transformer	2.00
7282	Transformer—Second intermediate transformer	2.40
7283	Transformer—Third intermediate transformer	3.25
7285	Capacitor pack—Comprising one 1.0 mfd., one 0.5 mfd. and two 0.1 mfd. condensers in metal container	2.10
7286	Capacitor pack—Comprising one 1.0 mfd., one 0.5 mfd. and three 0.1 mfd. condensers in metal container	2.50
7287	Bracket—Dial lamp bracket and indicator	.20
7288	Scale—Dial scale—Package of 5	$1.50
7297	Coil—R. F. choke coil for second detector or automatic volume control	.50
7298	Capacitor—0.01 mfd.	.40
7331	Cable—Shielded receiver cable	1.40
8703	Escutcheon—Station selector escutcheon	2.15
8708	Capacitor—Tuning capacitor assembly—Comprising four variable capacitors, drive; drive cord, spring and dial drum (assembled)	9.50
8714	Shield—Shield complete for receiver assembly	3.92
8777	Cover—Shield Removable Cover	.80
	S.P.U. REPRODUCER ASSEMBLY	
2546	Resistor—1 megohm—Carbon type—Package of 5	1.10
2725	Fuse—Glass type—1.5 amperes—Package of 5	.40
3045	Resistor—40,000 ohms—Carbon type—Package of 5.	1.10
3058	Resistor—100,000 ohms—Carbon type—Package of 5.	1.10
3085	Capacitor—400 mmfd.	.30
3099	Capacitor—0.005 mfd. capacitor	.50
3145	Resistor—700 ohms—Carbon type	.25
3147	Cover—Fuse cover with insulator	.60
3149	Switch—Operating switch—Toggle type—Assembled—Complete with mounting nuts and escutcheon	1.00
6114	Resistor—20,000 ohms—Carbon type—Package of 5.	1.10
7290	Reactor—Filter reactor	3.50
7293	Strip—Terminal strip—Complete with 8 terminals	.60
7294	Cover—Terminal strip cover for 7293	.25
7295	Strip—Terminal strip—Complete with 5 terminals	.50
7296	Cover—Terminal strip cover—5 terminals for 7295.	.25
7369	Socket—UY Radiotron socket complete with shield.	.50
8710	Transformer—Power transformer—105–125 volts, 50–60 cycles	9.52
8711	Transformer—Audio transformer assembly	4.25
8712	Capacitor pack—Comprising one 2.0 mfd., one 3.0 mfd., one 0.1 mfd. and two 0.5 mfd. condensers in metal container—60 cycles	4.60
8749	Transformer—Power transformer—105–125 volts—25–40 cycles	15.56
8750	Transformer—Power transformer—220 volts, 60 cycles	9.60
8751	Capacitor pack—Comprising two 4.0 mfd., two 0.5 mfd. and one 0.1 mfd. in metal container—25 cycles	4.60
10907	Fuse—3 amperes—Package of 5	.40
	REPRODUCER UNIT	
7292	Screw assembly—Comprising two screws, two nuts, two lockwashers and plate—For mounting speaker to amplifier	.40
8558	Cone—Reproducer cone	2.00
8559	Ring—Cone retaining ring	.25
8713	Coil—Reproducer field coil	3.16

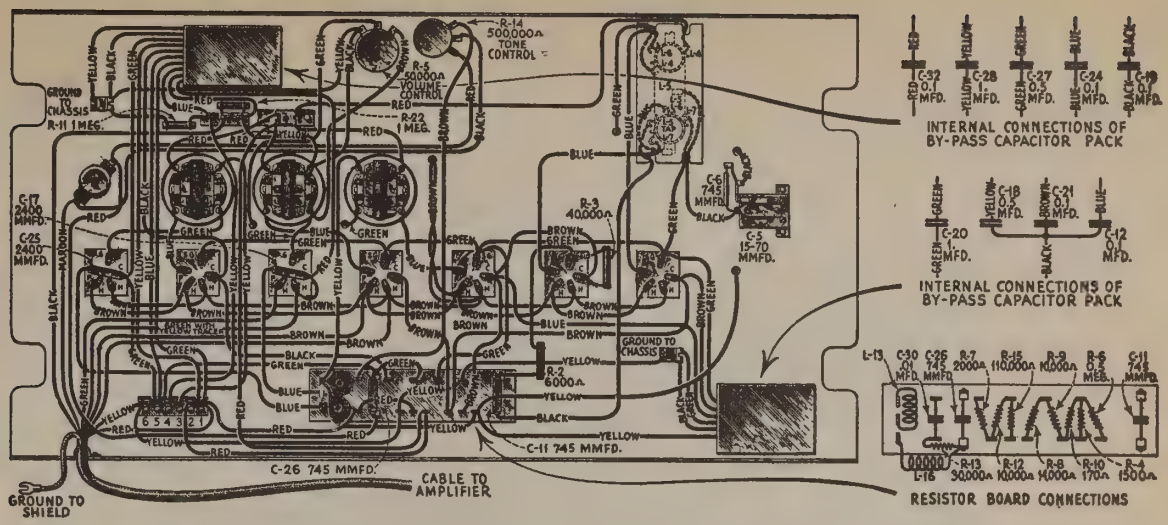

INTERNAL CONNECTIONS OF BY-PASS CAPACITOR PACK
INTERNAL CONNECTIONS OF BY-PASS CAPACITOR PACK
RESISTOR BOARD CONNECTIONS
CABLE TO AMPLIFIER
GROUND TO SHIELD
GROUND TO CHASSIS

Figure 2—Receiver Assembly Wiring Diagram

RADIOTRON SOCKET VOLTAGES

VOLTAGES ARE THE SAME AT EITHER POSITION OF THE VOLUME CONTROL
110 VOLT LINE

Radiotron No.	Heater to Cathode Volts	Cathode or Filament to Control Grid Volts	Cathode or Filament to Screen Grid Volts	Cathode or Filament to Plate Volts	Plate Current M. A.	Heater Volts
1. R. F.	2.0	*0.2	60	230	3.5	2.5
2. Osc.	5.0	0	—	50	4.0	2.5
3. 1st Det.	4.0	3.5	60	230	0.5	2.5
4. 1st I.F.	2.0	*0.2	60	230	3.5	2.5
5. A.V.C.	0	0	—	30	0.1	2.
6. 2nd I.F.	2.0	3.5	60	230	2.5	2.5
7. 2nd Det.	20.0	*8.0	—	210	0.5	2.5
8. Pwr.	—	*10.0	250	235	25.0	2.5
9. Pwr.	—	*10.0	250	235	25.0	2.5

***These readings are not correct due to the resistance in the circuits**

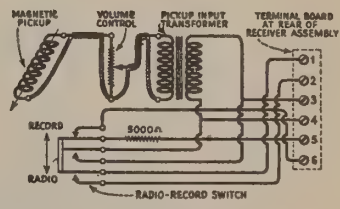


Figure 3—Magnetic Pickup connections

Note: Place the Radio-Record switch and input transformer in the receiver cabinet. Try connecting a wire from receiver terminal No. 6 to input transformer frame or braided shield to pickup and use connection that gives minimum hum.

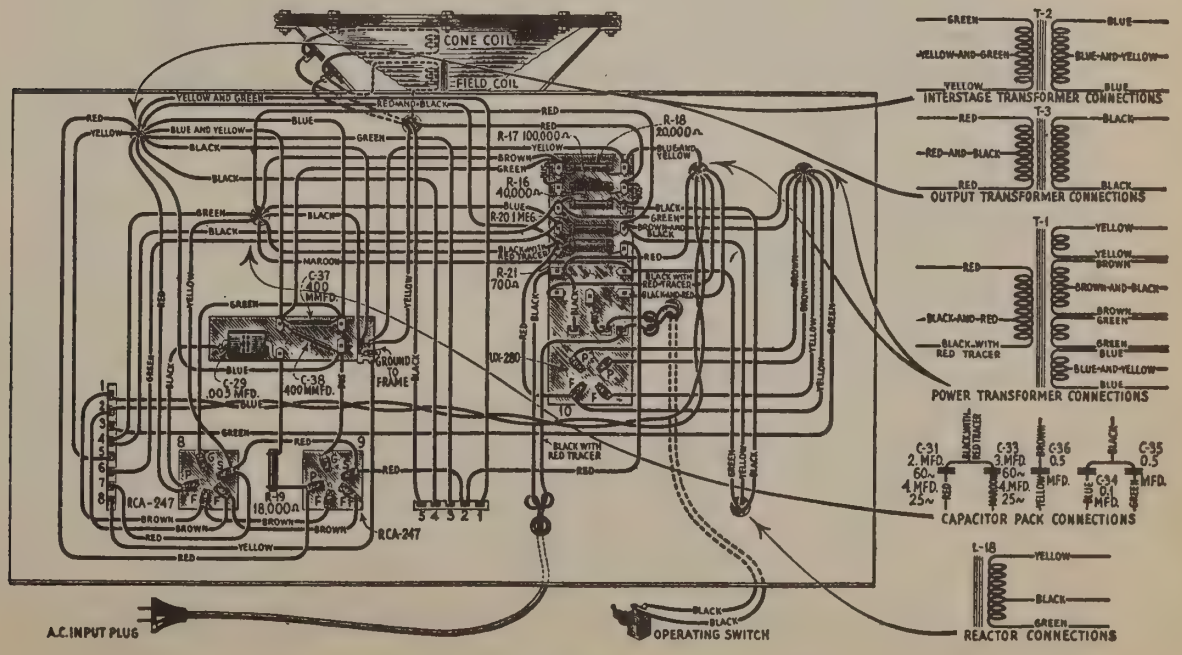


Figure 4—S. P. U. Reproducer Assembly Wiring

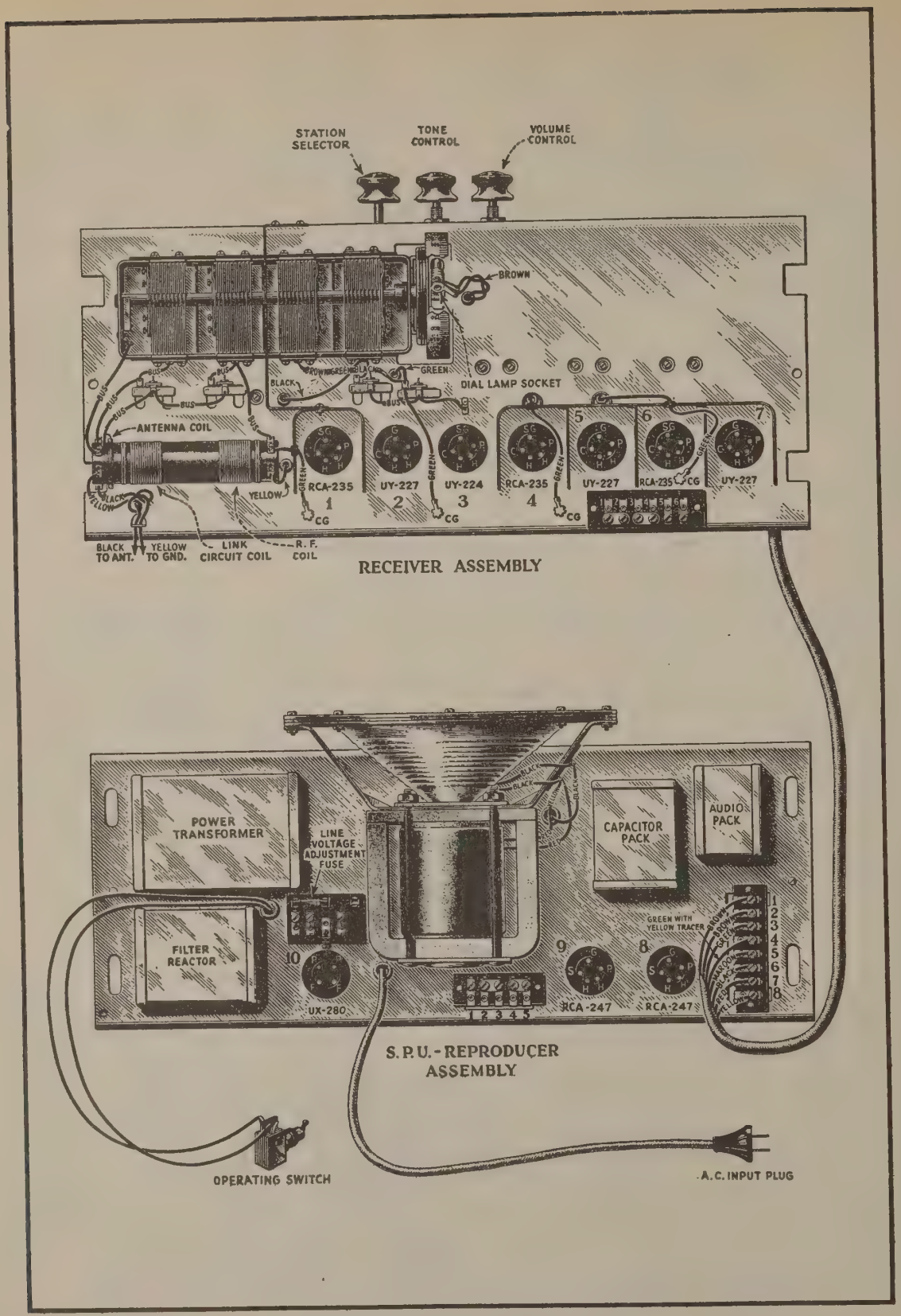


Figure 5—Assembly Wiring Diagram

Service Division
RCA Victor Company, Inc.
Camden, N. J.

S. O. 761075-40 2M

Printed in U. S. A.

SERVICE NOTES
for
RCA Victor Radiola Automatic Electrola, Model RAE-59

The RCA Victor RAE-59 is a Combination DeLuxe Radio and Automatic Phonograph instrument that provides a large variety of home entertainment features. The radio receiver, amplifier and loudspeaker are identical with those used in Models R-50 and 55. The automatic record changing mechanism is of simple, sturdy design and may be operated at 33⅓ R.P.M. as well as 78 R.P.M.

Excellent home recording is a feature of this instrument, its high quality being due to the use of a two button studio microphone and a high gain amplifier. Also a much greater power output is available, due to the use of Radiotrons RCA-247 in the output stage.

SERVICE DATA

A reference to the R-50 and R-55 Service Notes will give the details of any service work necessary in conjunction with the receiver and amplifier assemblies. Figure 1 shows the schematic wiring diagram and Figure 2 the assembly wiring. A reference to the Service Notes on the RCA Victor Record changing mechanism will give any details of service work in conjunction with this unit. The replacement parts are listed below. The service notes on the Automatic Mechanism will be found valuable in identifying many of these parts.

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
	RECEIVER	
2726	Socket—UY Type Radiotron socket with insulator—7 used	$0.70
2731	Resistor—10,000 Ohms—Carbon type—Package of 5	2.00
2732	Resistor—110,000 Ohms—Carbon type—Package of 5	2.00
2736	Resistor—170 Ohms—Carbon type—Package of 5	2.00
2746	Socket—Dial lamp socket	.50
2970	Resistor—500,000 Ohms—Carbon type—Package of 5	2.50
3031	Board—Terminal board with insulator—Three terminals	.50
3081	Resistor—16,000 Ohms—Carbon type	.60
3137	Knob—Tuning and control knob—Package of 5	3.25
3138	Board—Terminal board with soldering terminal bracket and insulator	.50
3139	Coil—Detector coil and shield	3.95
3142	Control—Volume control with mounting nut	1.65
3143	Control—Tone control with mounting nut	1.50
3144	Inductor—Tone control inductor	1.65
3152	Resistor—30,000 Ohms—Carbon type—Package of 5	2.75
3153	Resistor—1,500 Ohms—Carbon type—Package of 5	2.75
3154	Resistor—2,000 Ohms—Carbon type—Package of 5	2-75
3155	Resistor—9,000 Ohms—Carbon type—Package of 5	3.00
3240	Nut—Chassis shield removable cover mounting nut—Package of 13	.50
7062	Capacitor—Adjustable capacitor—2 used	1.00
7063	Capacitor—Adjustable capacitor—3 used	1.00
7278	Coil—R. F. coil	2.50
7280	Board—Terminal board—Six terminals	.90
7281	Transformer—1st Intermediate transformer	3.25
7282	Transformer—2d Intermediate transformer	3.50
7283	Transformer—3d Intermediate transformer	3.25
7284	Board—Resistor board with insulator—Less resistors, coils and capacitors	2.70
7285	Capacitor—Comprising one 1.0 Mfd., one 0.5 Mfd., and two 0.1 Mfd. capacitors in metal container	3.50
7286	Capacitor—Comprising one 1.0 Mfd., one 0.5 Mfd., and three 0.1 Mfd. capacitor in metal container	4.50
7287	Bracket—Pilot lamp bracket	.50
7288	Scale—Dial scale—Package of 5	2.50
7297	Coil—R. F. choke coil	.75
7298	Capacitor—Capacity 0.01 Mfd.	.80
7299	Capacitor—Capacity of 745 Mfd.	.70
8708	Condenser—Tuning condenser assembly—Comprising four condensers, drive, drive cord and dial drum—Assembled	12.25
8714	Shield—Receiver shield complete	6.50
8777	Cover—Receiver shield removable cover	1.30
	SPEAKER	
7292	Screw Assembly—Comprising two screws, two nuts, two lock washers and plate—For mounting speaker to amplifier—Package of 1 set	.95
8558	Cone—Reproducer paper cone	4.00
8559	Ring—Cone retaining ring	$0.80
8713	Coil—Reproducer field coil	5.00
	AMPLIFIER	
2546	Resistor—1 Megohm—Carbon type—Package of 5	3.00
2725	Fuse—Glass type—1.5 amperes—Package of 5	.50
2882	Socket—UY Radiotron socket with insulator	.50
3045	Resistor—40,000 Ohms—Carbon type—Package of 5	2.50
3058	Resistor—100,000 Ohms—Carbon type—Package of 5	2.50
3099	Capacitor—.005 Mfd. paper capacitor	.75
3145	Resistor—700 Ohms—Carbon type—Package of 1	.85
3146	Board—Terminal board with insulator—Less capacitor	1.25
3147	Cover—Fuse cover with insulator	.95
3149	Switch—Starting switch—Toggle type—With mounting nuts and escutcheons	1.25
5817	Resistor—20,000 Ohms—Carbon type	.90
7217	Transformer—Step down transformer—230 volts to 115 volts	18.00
7290	Reactor	4.75
7291	Board—Resistor terminal board—Less resistors	.50
7293	Strip—Terminal strip—8 terminals	1.15
7294	Cover—Terminal strip cover—8 terminals	.60
7295	Strip—Terminal strip—5 terminals	.85
7296	Cover—Terminal strip cover—5 terminals	.60
8710	Transformer—Power transformer—105-120 V., 50-60 cycles	12.50
8711	Transformer—Audio transformer	6.60
8712	Capacitor—Comprising one 2 Mfd., one 3 Mfd., one .1 Mfd. and two .5 Mfd. condensers in metal container	7.80
8749	Transformer—Power transformer—25-30 cycles	20.50
8750	Transformer—Power transformer—220 volts—60 cycles	13.00
8751	Capacitor pack—Comprising two 4.0 Mfd., two 0.5 Mfd., one 0.1 Mfd. capacitor in metal container	9.50
10907	Fuse—3 amperes—Package of 5	.50
	MOTOR BOARD AND AUTOMATIC RECORD CHANGER	
2614	Switch	1.40
2620	Cushion—Pickup rubber cushions—Comprising two pivots and one damper cushion—Package of 5 sets	1.25
2767	Spring—Pickup magnet spring—Package of 10	.50
2768	Armature—Pickup armature	.50
2769	Coil—Pickup coil	.50
2770	Plate—Pickup damper plate—Package of 5	.50
2771	Screw—Pickup damper plate mounting screw—Package of 10	.50
2779	Pointer—Recording control switch metal pointer—Package of 10	.50
2857	Plug—Three way male connector plug	.70
2893	Spring—Trip lever spring—Package of 10	.60
2896	Spring—Cable lever spring—Package of 10	.50
2897	Screw and Nut—Pickup arm cable adjusting screw and nut—Package of 5	.50

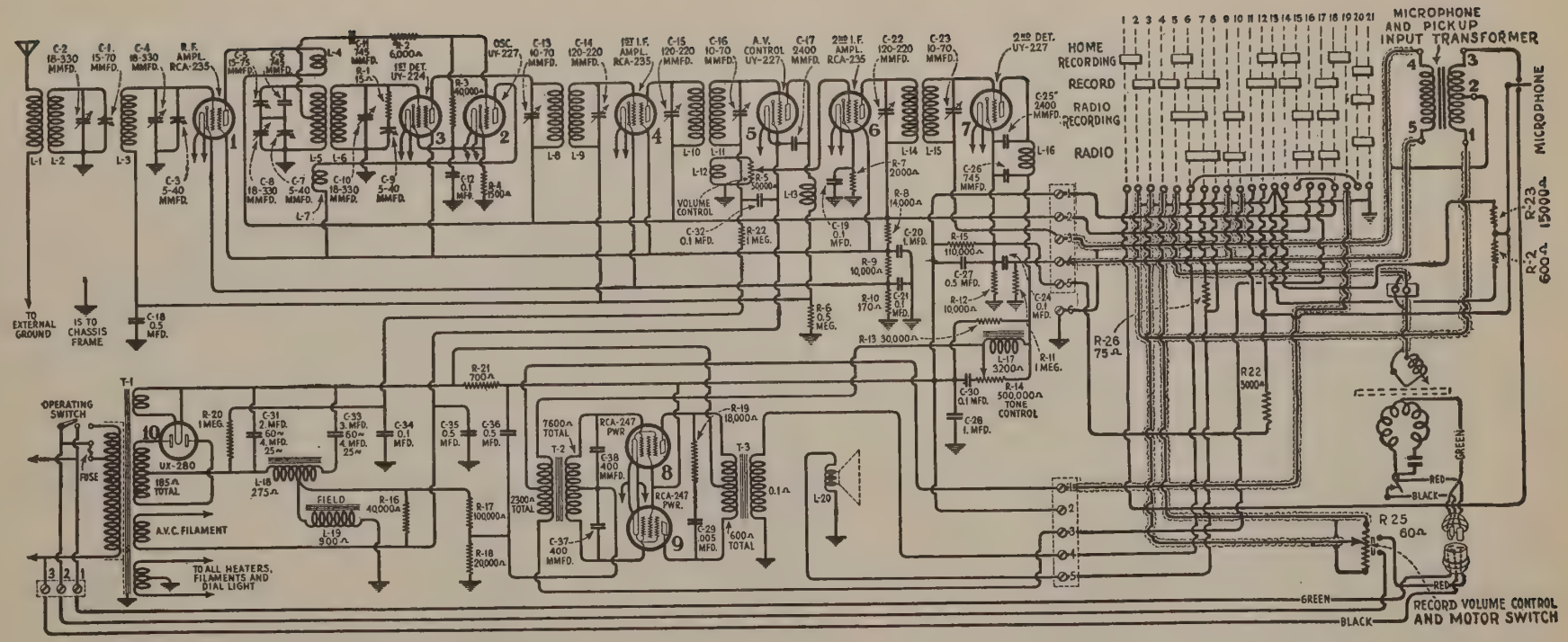


Figure 1—Schematic Wiring Diagram of Model RAE-59

REPLACEMENT PARTS (Continued)

Stock No.	DESCRIPTION	List Price
	AUTOMATIC RECORD CHANGER—Continued	
2898	Screw and Nut—Adjusting screw and lock nut for elevator shaft—Package of 10	$0.50
2902	Screw and Nut—Motor turntable spindle thrust screw and nut—Package of 10	.50
2903	Screw—Motor mounting screw—Package of 10	.50
2904	Lever—Front elevator actuating lever	.50
2905	Screw—Gear and bracket mounting screw—Package of 10	.50
2906	Spring—Check lever spring—Package of 10	.50
2907	Screw—Clutch set screw—Package of 10	.50
2908	Spring—Clutch pawl spring—Package of 10	.50
2909	Spring—Four finger lever spring—1⅛" long—Package of 10	.60
2910	Spring—Four finger lever spring—1⅛" long—Package of 10	.60
2911	Screw—Slide bracket screw—Package of 10	.50
2912	Roller—Slide roller complete with screw stud—Package of 5	1.50
2913	Spring—Cable lever spring—Package of 10	.60
2914	Spring—Flat spring with screws—Package of 10	.50
2915	Spring—Locating lever spring—Package of 10	.50
2916	Plate—Latch plate with mounting screws—Package of 5	.50
2917	Washer—Spring washer—Package of 10	.50
2918	Spring—Index lever spring—Package of 10	.50
2919	Screw and Nut—Stop screw and nut—Package of 10	.50
2920	Washer—Friction washer—Package of 10	.50
2929	Lever—Rear elevator actuating lever—Package of 2	.50
3052	Screw Assembly—Pickup pole shoe mounting screws, nut and washer—Package of 10 sets	.50
3159	Friction brake—Gear reducing friction brake spring and pad with mounting rivets—Package of 4	2.00
3161	Spring—Shift lever spring—Package of 5	1.20
3167	Magnet—Pickup magnet	2.60
3169	Pole shoe—Pickup pole shoe—R. H.	1.45
3170	Pole shoe—Pickup pole shoe—L. H.	1.45
3173	Plug—Three prong female connector plug	1.30
3175	Receptacle—Needle receptacle	.75
3181	Cable—10" Red lead shielded cable—Volume control to control switch—Package of 2	.70
3182	Cable—10" Green lead shielded cable—Volume control to control switch—Package of 2	.70
3183	Socket—Microphone socket—Package of 5	2.00
3184	Board—Terminal board	.50
3186	Control—Volume control and operating switch complete with mounting washer and nut	2.20
3187	Weight—Recording weight	1.40
3189	Box—Needle box with lid—Package of 2	.70
3190	Clutch pawl	1.25
3191	Ratchet—Gear and ratchet with set screw	.90
3192	Post—Roller post assembly for supporting magazine	.75
3193	Screw—Magazine bearing mounting screw and nut—Package of 10	.50
3194	Screw—Pickup arm base mounting screw and nut—Package of 10	.50
3195	Lever—Record transfer lever with screw and nut	1.65
3196	Screw—Record transfer lever mounting screw and nut—Package of 10	.50
3197	Escutcheon—Turntable speed escutcheon plate with mounting rivets—Package of 2	.70
3198	Bushing—Insulator rubber bushing—Package of 10	.50
3199	Screw—Bottom plate mounting screw—Package of 10	.50
3200	Shaft—Front or rear elevator shaft	.80
3201	Rear elevator pad—Package of 5	2.75
3202	Front elevator pad—Package of 5	3.00
3203	Screw—Elevator pad mounting screw—Package of 10	.50
3204	Cable—Pickup arm cable—Package of 5	1.50
3205	Screw—Pickup needle holder screw—Package of 10	.80
3206	Cover—Pickup cover	.75
3207	Screw—Pickup cover mounting screw—Package of 10	.50
3208	Screw assembly—Pickup mounting screw, nut and washer—Package of 10	.60
3209	Lever—Trip lever	1.10
3210	Lever—Magazine lever	.65
3211	Washer—Turntable spindle leather washer—Package of 10	.50
3212	Spring—Turntable spindle plunger spring—Package of 10	.50
3213	Bolt—Motor board mounting bolt—Package of 8	.90
3214	Pulley—Cable pulley with mounting stud—Package of 5	.50
3215	Plug—Microphone cord plug	.50
3216	Cushions—Microphone rubber cushions—Package of 6	.50
3217	Lever—Check lever	.50
3261	Cap—Rubber cap for turntable spindle—Package of 5	.50
3262	Screw and Nut—Record transfer lever adjusting screw and nut—Package of 10	.60
7151	Back—Pickup back housing	.50
7186	Gear—Gear and bracket	1.40
7188	Bracket—Slide bracket with roller	.75
7189	Lever—Front and rear elevator cam lever—Package of 5	$2.20
7190	Lever—Locating lever	.85
7191	Lever—Cable lever	.60
7192	Cam—Cam gear and cam	1.50
7194	Rotor and shaft—60 cycles	8.00
7204	Rotor and shaft—50 cycles	8.00
7305	Gear reducing unit—Complete	4.50
7309	Cable—40" black lead shielded cable—Record changer to control switch—Package of 2	1.00
7310	Cable—From switch to tapped resistor	.60
7311	Resistor—20675 Ohm tapped porcelain resistor	2.00
7312	Transformer—Input transformer	6.55
7313	Switch—Selector switch with mounting nut and escutcheon	6.40
7314	Cable—Power cable—From S.P.U. to Automatic record changer	1.25
7315	Spindle and gear—Turntable spindle with gear—25 cycles	6.00
7316	Spindle and gear—Turntable spindle with gear—30 cycles	6.00
7317	Spindle and gear—Turntable spindle with gear—50 cycles	5.00
7318	Spindle and gear—Turntable spindle with gear—60 cycles	5.00
7319	Rotor and shaft—25 cycles	10.00
7320	Rotor and shaft—30 cycles	10.00
7321	Lever—Cable guide lever with pulley	.90
7322	Lever—Manual Index lever	.60
7323	Magazine bearing—Located on motor board	1.35
7324	Pickup arm base	.85
7325	Pickup—Pickup unit complete	12.50
7326	Cover—Turntable cover	.50
7327	Mechanism—Microphone mechanism	14.95
7328	Cover assembly—Microphone cover frame and screen	1.25
7329	Frame—Microphone frame with handle—Less cover assembly	1.50
7330	Capacitor—Motor capacitor 3.75 Mfd. for 25 or 30 cycles	4.00
7363	Pad—Rubber pad for front elevator—Package of 10	.50
7364	Lever—Speed reducing shift lever	.50
7387	Reactor—Tone compensating reactor with bracket	.85
8644	Capacitor—Motor capacitor 1.25 Mfd., for 105-125 volts—50-60 cycles	1.40
8646	Slide—Main slide	2.20
8647	Lever—Four finger lever	1.20
8747	Cable—Main cable—From S.P.U. receiver chassis, input transformer and motor board	2.90
8748	Microphone—Complete	21.50
8752	Motor—Motor complete—25 cycles	41.00
8753	Motor—Motor complete—30 cycles	41.00
8754	Motor—Motor complete—50 cycles	41.00
8755	Motor—Motor complete—60 cycles	33.50
8756	Motor board—Motor board with elevator bushings, turntable speed plate and shaft lever	5.50
8757	Arm—Pickup arm complete with weight—Less pickup unit	6.00
8758	Magazine—Record magazine	4.00
8759	Turntable—Turntable with cover	5.00
	CABINET	
2776	Catch—Door catch and strike with nail—Package of 2 sets	.50
2785	Hinge—Lid hinge with mounting screws—Package of 2	.50
3156	Metal label—Trade mark label—Package of 5	2.50
3172	Knob—Door knob and mounting screw with back plate—Package of 2	1.00
3176	Fill piece—Front and rail angle fill piece	.75
3177	Fill piece—Front end rail bottom fill piece	.55
3178	Fill piece—Front end rail center fill piece	.60
3179	Fill piece—Front end rail top fill piece	.55
3180	Fill piece—Front rail angle fill piece	1.25
7095	Hinge—Door hinge—One set complete—Comprising 4 hinges	1.00
7279	Screen holder	.50
8703	Escutcheon—Tuning dial escutcheon	2.15
8736	Doors—R. H. and L. H. Doors—1 Pair	9.50
8738	Leg—Front leg—R. H. or L. H.	5.00
8739	Leg—Back leg—R. H. or L. H.	3.55
8740	Foot—Front leg foot—R. H. or L. H.	1.60
8741	Foot—Back leg foot—R. H. or L. H.	1.55
8742	Grille—Wood grille	4.60
8743	Ornament—Door top rail ornament	2.15
8744	Overlay—Front top rail end overlay—R. H. or L. H.	1.20
8745	Overlay—Front top rail center overlay	2.05
8746	Board—Baffle board grille cloth and cone felt—Assembled	1.55
8760	Support—Lid support	1.25
9384	Cabinet—Cabinet complete—Less equipment	133.00
9385	Lid	14.45
9386	Panel—Control panel	6.50
9387	Stretcher	6.90

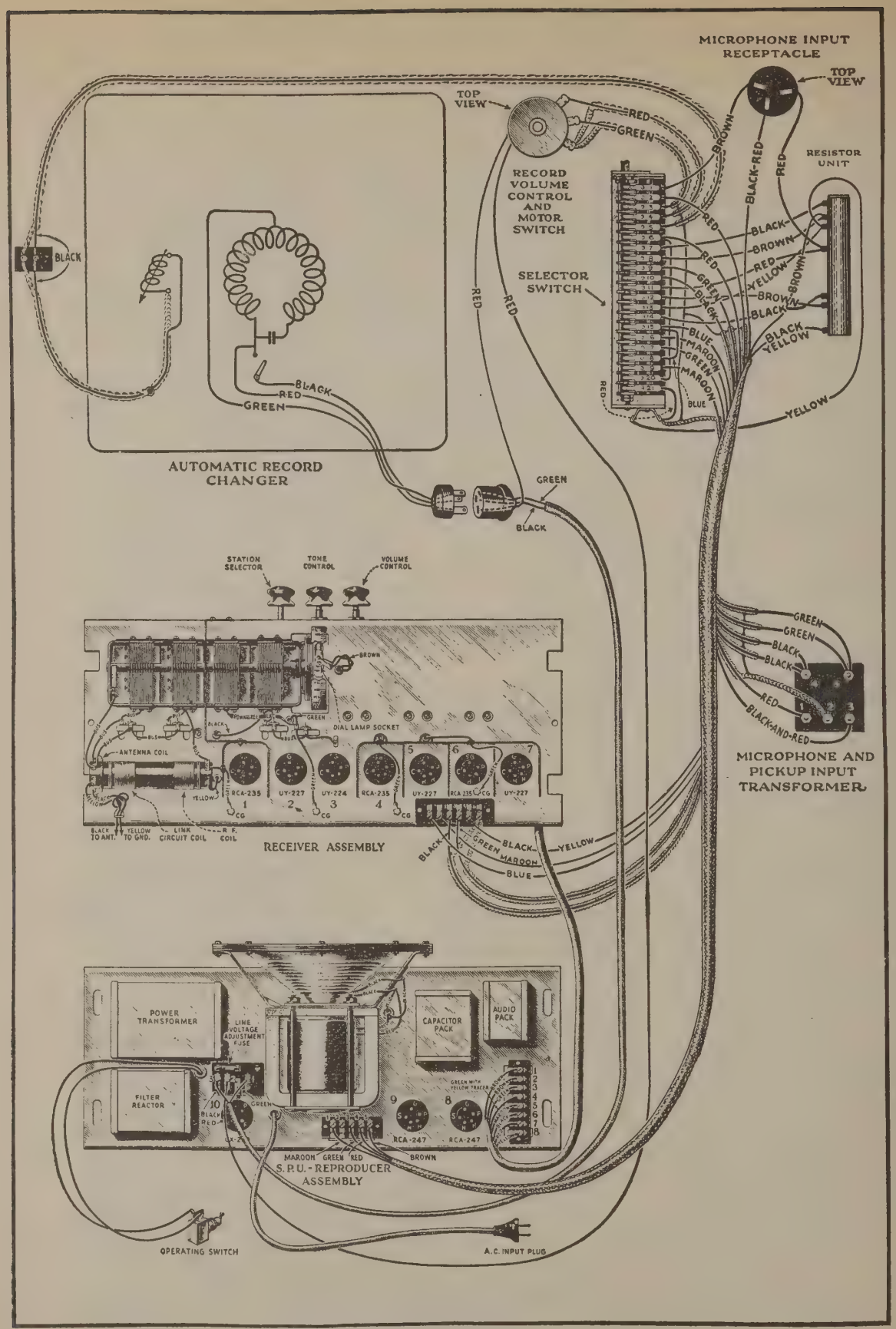


Figure 2—Assembly Wiring Diagram of Model RAE-59

SERVICE DIVISION

RCA Victor Company, Inc.

Camden, N. J., U. S. A.

S. O. 8495 175—11-17-'39

RCA Victor
Model RAE-68

SERVICE NOTES

RCA Victor Model RAE-68

RCA Victor Company, Inc.

Camden, N.J.

A RADIO CORPORATION OF AMERICA SUBSIDIARY

REPRESENTATIVES IN PRINCIPAL CITIES

CONTENTS

Page

Specifications 3
Description 3
Installation 3
Replacement Parts—Key Numbers 1 to 13 4
Replacement Parts—Key Numbers 14 to 23 5
Replacement Parts—Key Numbers 24 to 28 6
Replacement Parts—Key Numbers 29 to 57 7
Servicing 8
(1) Needle Fails to Swing Into First Groove 8
(2) Needle Fails to Lower in Proper Position 8
(3) Needle Fails to Lower Onto Record Surface 9
(4) Needle Fails to Clear Record After Playing 9
(5) Failure of Record to Deposit on Turntable 9
(6) Records Discharge Improperly from Turntable 10
(7) Failure to Trip on Eccentric Groove 11
(8) Inability to Set for Manual Operation 11
(9) Failure to Start 12
(10) Failure to Stop 12
(11) Continued Tripping of Mechanism 12
(12) Clutch Slipping 13
(13) Retiming the Mechanism 13
(14) Removing Motor Board 14
(15) Lubrication 15

Property of the RCA Victor Company, Inc. Confidential and to be used only by its Authorized Distributors and Dealers in furnishing service in connection with its apparatus.

Copyright April, 1931—RCA Victor Company, Inc.

RCA Victor Model RAE-68

SERVICE NOTES

SPECIFICATIONS

Voltage Rating	105/125 Volts.
Frequency Rating	50 and 60 Cycles
Maximum Power Consumption	60 Cycles—150 Watts
Maximum Power Consumption	50 Cycles—155 Watts
Height	38½ Inches
Width	41¾ Inches
Depth	21$\frac{37}{32}$ Inches
Weight	284 Pounds
Weight Packed for Shipment	362 Pounds

DESCRIPTION

The Model RAE–68 is a combination instrument containing the RCA Radiola 82 receiver with remote control and the RCA Victor automatic electric phonograph. The instrument will play ten 10-inch records automatically, or it can be set by means of a convenient lever to play either 10-inch or 12-inch records singly without the automatic feature.

One of the features of the instrument is the safety clutch arrangement which prevents the mechanism from jamming during the cycle should any of the moving parts happen to bind. A spring on the tone arm also prevents the possibility of damage being caused to the mechanism by moving the arm while the mechanism is in cycle.

Another feature is the capacitor type motor which furnishes more than ample power for operation of the instrument with a minimum power consumption. The motor is dependent upon proper power supply frequency to maintain its speed and, therefore, does not require a speed regulator or governor. A 1.25 mfd. condenser connected in the motor field circuit produces sufficient phase displacement to cause the motor to be self starting. The standard instruments are designed for operation on 105 to 125 volts, 60 cycles. Maximum power consumption is 150 watts. Special instruments are available for operation on 105 to 125 volts, 50 cycles.

INSTALLATION

Reference should be made to the instruction card and to the Radiola 80 series of Service Notes for complete information on installation. An important point to bear in mind on the RAE–68 is that the cabinet must be level for correct operation of the needle swing into the first record groove.

Replacement Parts for RCA Victor Model RAE-68

Automatic Mechanism

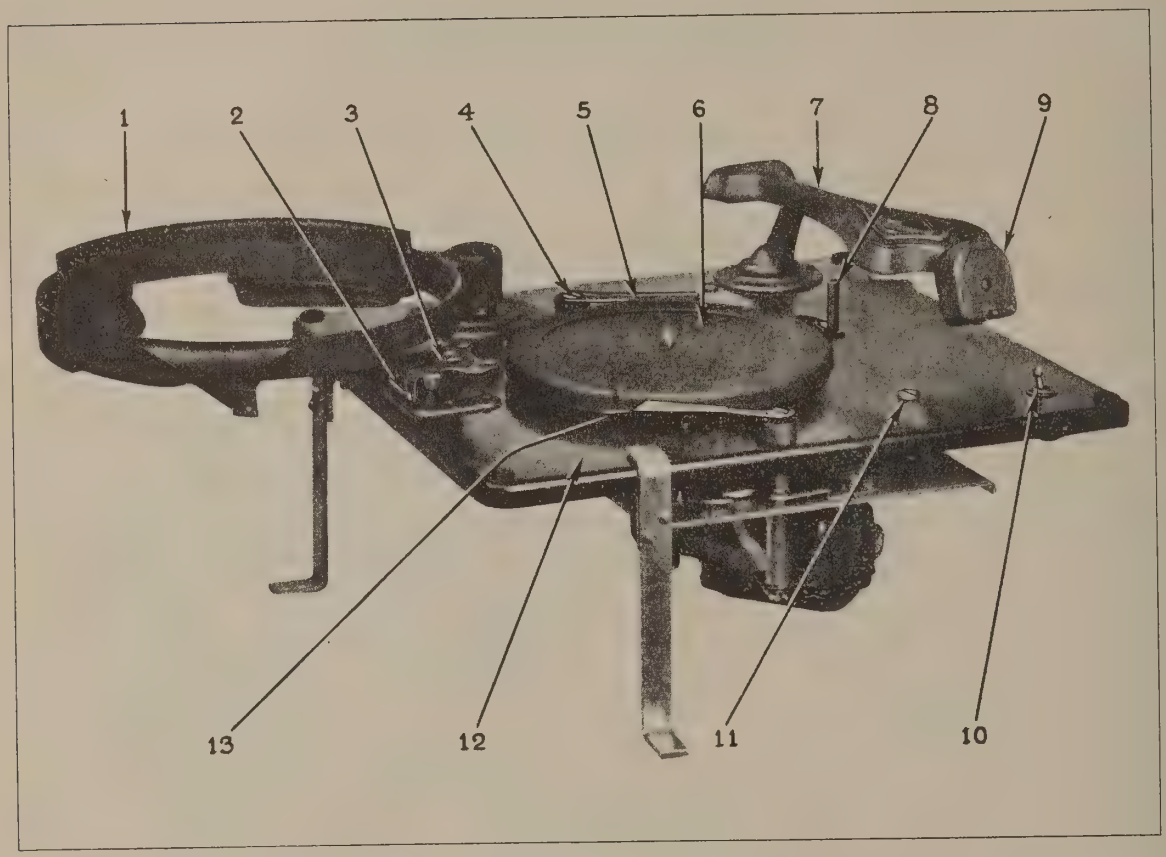


Figure 1—Top View of Automatic Mechanism

Key No.	Stock No.	DESCRIPTION	List Price
1	8641	Magazine — Record magazine complete with washer	$3.50
2	2883	Screw and nut—For record transfer lever (Pkg. of 10)	.50
3	2884	Lever—Record transfer lever complete with screw and nut	1.50
4	2885	Screw — Elevator pad screw (Pkg. of 10)	.50
5	2886	Pad—Rear elevator pad (Pkg. of 5)	2.50
6	8642	Turntable	2.00
	2887	Washer — Turntable leather washer (Pkg. of 10)	.50
7	8643	Arm—Tone arm and base complete with screws and nuts	$4.00
	2825	Block—Pickup connector block and wire (Not illustrated)	1.10
8	2888	Lever — Manually operated lever	.50
9	7085	Pickup—Magnetic pickup complete, less tone arm	12.50
10		Switch—Not used	
11	2889	Screw—Bottom plate mounting screw (Pkg. of 10)	.50
12	9313	Motor board	5.50
13	2890	Pad—Front elevator pad (Pkg. of 5)	2.50

Replacement Parts for RCA Victor Model RAE-68

Automatic Mechanism

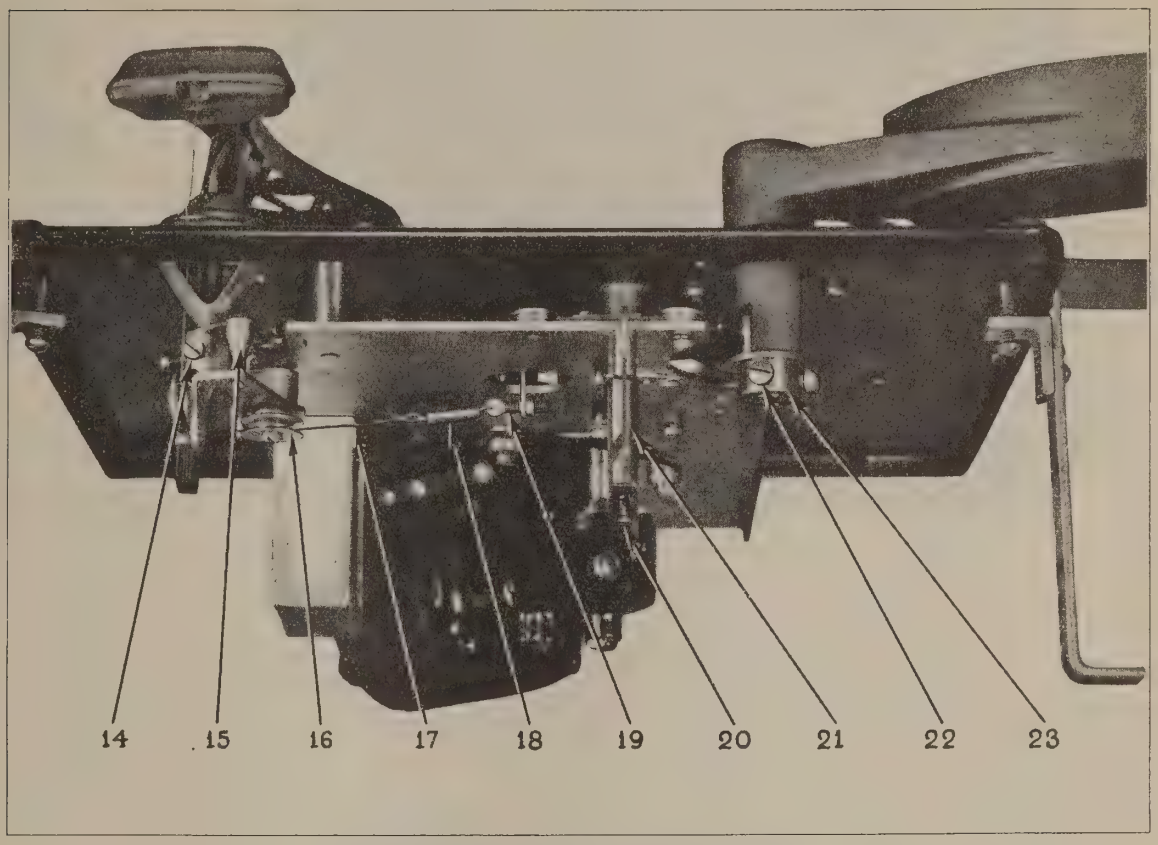


Figure 2—Back View of Automatic Mechanism

Key No.	Stock No.	DESCRIPTION	List Price
	2891	Screw—Trip lever set screw (Pkg. of 10)	$0.50
14	2892	Lever—Trip lever, complete with set screws	.90
15	2893	Spring—Trip lever spring (Pkg. of 10)	.60
16	2894	Pulley—Complete with stud screw (Pkg. of 5)	.50
17	2895	Cable—Pickup arm operating cable (Pkg. of 5)	1.20
18	2896	Spring — Pickup arm cable spring (Pkg. of 10)	$0.50
19	2897	Screw and nut—For pickup arm cable (Pkg. of 5)	.50
20	2898	Screw and nut—For elevator shaft (Pkg. of 10)	.50
21	2899	Shaft—Elevator shaft complete with screw and nut	.70
22	2900	Screw—Magazine lever screw (Pkg. of 10)	.50
23	2928	Lever—Magazine lever	.50

Miscellaneous Parts Not Illustrated

Stock No.	DESCRIPTION	List Price
2923	Knob—Tuning knob and tone control knob (Pkg. of 5)	$2.50
2924	Knob—Local-Distance switch knob (Pkg. of 5)	2.50
2925	Knob—Pickup volume control and control switch knob (Pkg. of 5)	2.50
7078	Volume control—60 ohms volume control	1.50
7083	Transformer—Pickup input transformer	$5.00
7196	Lamp—Compartment lamp (Pkg. of 5)	5.50
7198	Switch—Control switch	5.00
2563	Resistor—6000 ohms resistor (Used on control switch) (Pkg. of 5)	3.00

Replacement Parts for RCA Victor Model RAE-68

Automatic Mechanism

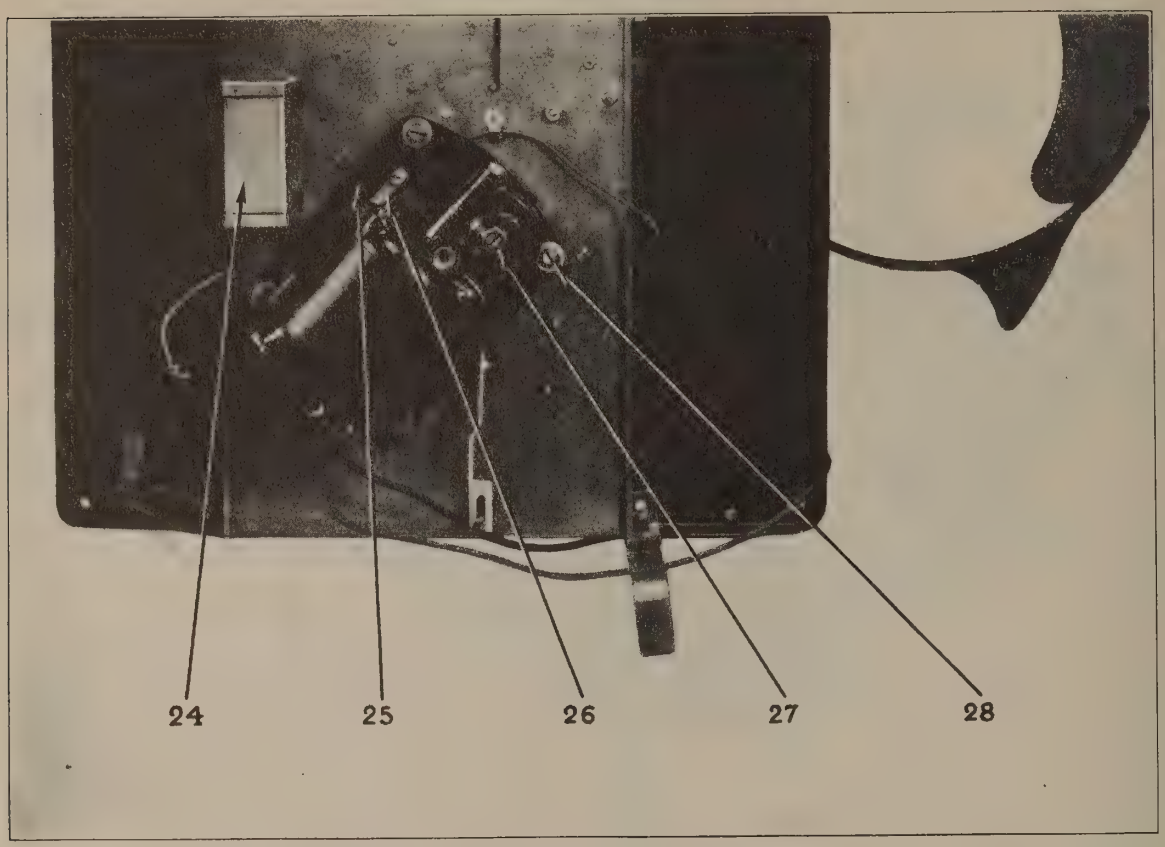


Figure 3— Under View of Automatic Mechanism

Special Parts

To be supplied on special order only. Not to be stocked

Key No.	Stock No.	DESCRIPTION	List Price
24	8644	Capacitor—Motor capacitor—1.25 mfd	$1.40
25	8645	Base—Motor base	
26	2901	Springs—Motor base springs complete with 8 screws (Pkg. of 2)	.50
27	2902	Screw and nut—Motor thrust (Pkg. of 10)	.50
28	2903	Screw—Motor mounting screw (Pkg. of 10)	.50
	7194	Rotor and shaft (60 cycles)	
	7204	Rotor and shaft (50 cycles)	
	7195	Spindle and gear—Turntable spindle complete with gear (60 cycles)	
	7205	Spindle and gear—Turntable spindle complete with gear (50 cycles)	
	2921	Tip — Turntable spindle tip, spring and pin (Pkg. of 5)	
	7206	Bearing — Turntable spindle bearing	
	8648	Motor complete (60 cycles)	32.50
	8649	Motor complete (50 cycles)	
	2752	Support—Screen support	.50
	2775	Stop—Door stop with mounting screws (Pkg. of 5)	$0.65
	2776	Catch—Door catch and strike with nail (Pkg. of 2)	.50
	2922	Hinge—Lid hinge with mounting screws (Pkg. of 2)	.50
	2926	Pull—Door pull complete (Pkg. of 3)	3.00
	2927	Hinge—Door hinge with mounting screws (Pkg. of 2)	.50
	7197	Shade — Compartment lamp Shade (Pkg. of 5)	1.75
	7199	Support—Lid support R. H. with mounting screws	3.50
	7200	Support—Lid support L. H. with mounting screws	5.00
	7201	Cable—Inside cable	4.50
	7202	Bolt assembly—For mounting mechanism in cabinet (Set of 4)	.80
	8584	Escutcheon — Tuning dial escutcheon	3.00
	8585	Grille	2.00
	8587	Baffle Board—Complete with grille cloth and pad	2.00

Replacement Parts for RCA Victor Model RAE-68

Automatic Mechanism

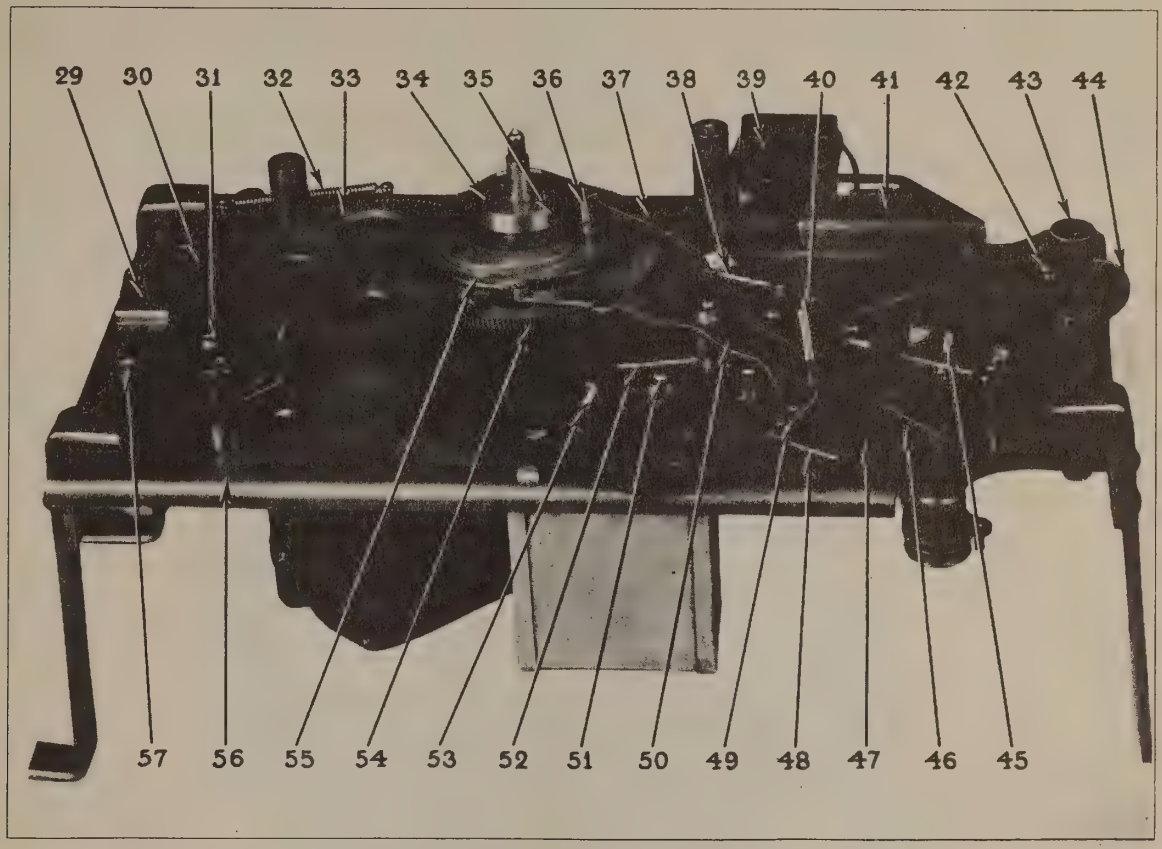


Figure 4—Top View of Automatic Mechanism with Motor Board Removed

Key No.	Stock No.	DESCRIPTION	List Price
29	2904	Lever—Front elevator shaft actuating lever	$0.50
	2929	Lever — Rear elevator shaft actuating lever (Not illust.) (Pkg. of 2)	.50
30	8646	Slide	2.20
31	2905	Screw—Gear and bracket mounting screw (Pkg. of 10)	.50
32	2906	Spring—Check lever spring (Pkg. of 10)	.50
33	7186	Gear and bracket	1.40
34	7187	Clutch—Complete with set screw	.80
35	2907	Screw—Clutch set screw (Pkg. of 10)	.50
36	2908	Spring — Clutch pawl spring (Pkg. of 10)	.50
37	8647	Lever—Four finger lever	1.20
38	2909	Spring—Four finger lever spring (Pkg. of 10)	.60
39	2614	Switch—Motor switch complete	1.50
40	2910	Spring — Four finger spring (Pkg. of 10)	.60
41	7188	Bracket — Slide bracket complete with screws	.75
42	2911	Screw—For slide bracket (Pkg. of 10)	.50
43	2912	Roller—Slide roller complete with screw stud (Pkg. of 5)	$1.50
44	7189	Lever — Elevator cam lever (Pkg. of 5)	2.20
45	2913	Spring—Four finger lever spring (Pkg. of 10)	.60
46	2914	Spring—Flat spring complete with two screws (Pkg. of 10)	.50
47	7190	Lever—Locating lever	.85
48	2915	Spring—Locating lever spring (Pkg. of 10)	.50
49	2916	Plate—Latch plate complete with 2 screws (Pkg. of 5)	.60
50	7191	Cable lever	.60
51	2917	Washer—Spring washer (Pkg. of 10)	.50
52	2918	Spring—Index lever (Pkg. of 10)	.50
53	2919	Screw and nut—Stop screw complete with nut (Pkg. of 10)	.50
54	7192	Cam and gear	1.50
55	7193	Pawl—Clutch pawl	1.00
56	9314	Plate—Bottom plate	3.50
57	2920	Washer—Friction washer (Pkg. of 10)	.50

SERVICING

The service information which follows applies only to the automatic mechanism. Service data on the Radiola, the remote control units and the electric phonograph are covered in service notes of the Radiola 80 series. Copies of these service notes can be obtained from your Distributor.

All of the major adjustments can be made from the back of the cabinet without removing the mechanism. For the sake of clearness, the illustrations which follow are shown with the mechanism removed.

No special tools are required other than a small offset screw driver, such as Stock No. 2930, and a suitable support for the mechanism such as the three metal stands shown in the illustrations (three units, Stock No. 7203).

(1) Needle Fails to Swing Into First Groove—A small flat spring pressing against the tone arm lever causes the needle to swing into the first record groove after descending onto the smooth outer rim. If the needle does not move into the first groove properly, the condition may be caused by:

(a) *Cabinet Not Level*—Place a spirit level on the motor board parallel with the cabinet front, and note whether or not the instrument is level. If it is not, a small wooden wedge or a piece of heavy cardboard should be placed under the feet at the low side of the cabinet.

(b) *Weak Spring Tension*—Weak tension of the flat spring against the tone arm lever will prevent the needle from swinging over properly into the record groove. This condition can be corrected by bending the spring slightly to increase its pressure. *Do not bend the spring too much since excessive pressure will cause the needle to swing in more than one groove.*

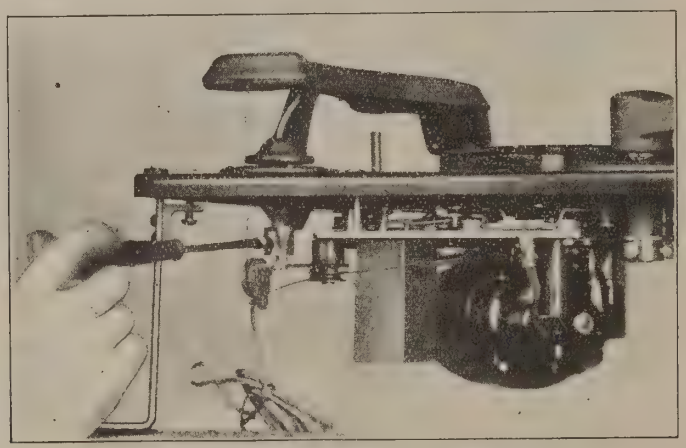


Figure 5—Adjusting Tone Arm Setting

(2) Needle Fails to Lower in Proper Position—Failure of the needle to lower into the smooth outer rim of the 10-inch records when the instrument is playing automatically may be caused by:

(a) *Improper Tone Arm Setting*—Loosen the set screws as shown in Figure 5. With the mechanism out of its cycle, press the locating lever 47, Figure 4, at a point near the arrow head until the lever strikes the stop screw 53, Figure 4. Holding the locating lever in this position, move the front portion of the trip lever 15, Figure 2, until the pin, against which the flat spring operates, is making contact with the locating lever. Holding the two levers in this position, move the pickup arm until the needle is $\frac{1}{16}$" away from the first groove of a standard 10-inch record. Now retighten the two set screws shown in Figure 5.

(b) *Improper Adjustment of Locating Screw*—This adjustment screw shown at 53, Figure 4, can be used to make a substitute adjustment for that described in (a) above, when the mechanism is out of the cabinet, and should be so regulated that the needle will lower exactly $\frac{1}{16}$" away from the first groove on a standard 10-inch record. Loosen the lock nut on the adjusting screw by means of a No. 4 Spintite wrench on which the shoulder has been ground sufficiently thin for clearance. Make the necessary adjustment as shown in Figure 6. *Caution—Do not attempt to make this adjustment without first loosening the lock nut since the screw will likely snap.* Tighten the lock nut when the proper adjustment has been made.

(3) Needle Fails to Lower Onto Record Surface—Failure of the needle to lower onto the record surface may be caused by:

(a) *Cable Out of Pulleys*—Examine the tone arm cable and note if it is properly seated in the pulleys.

(b) *Shielded Pickup Wire Improperly Placed*—Examine the shielded lead coming out of the tone arm base to note if it is free from the moving parts of the mechanism.

(c) *Incorrect Setting of the Tone Arm Lowering Screw*—Loosen the lock nut as shown in Figure 7, adjust the screw so that a full volume needle when placed all the way in the pickup can be lowered properly onto the record on the turntable.

(d) *Turntable Washer Not in Place*—A felt washer is supplied to fit under the turntable. If this part is not in place, the turntable will be too low, and may cause the needle not to lower onto the record.

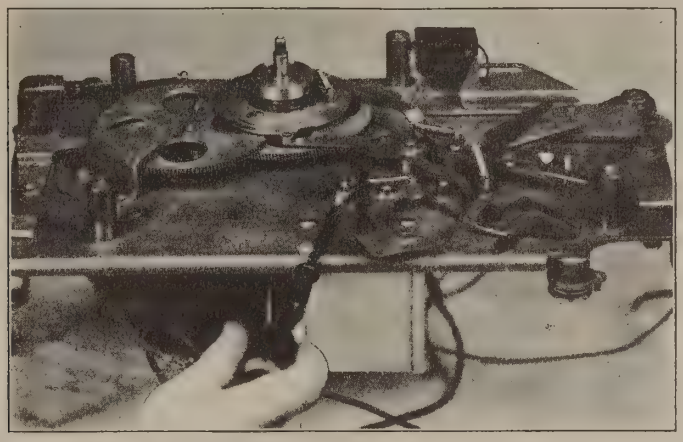


Figure 6—Adjusting Tone Arm Locating Lever

(e) *Incorrect Adjustment of Cable Tension Screw*—The cable tension screw 19, Figure 2, should be so adjusted that the needle will lower smoothly onto the record without dropping. When this adjustment is obtained, the cable will be slightly loose when the needle is lowered onto a record. Loosen the lock nuts, turn the screw to the right or left as required (see Figure 8), and retighten the lock nut. Check the adjustment to make sure the needle clears the record on the return of the tone arm. The needle should rise $\frac{1}{16}''$ from the record before any horizontal motion takes place.

Figure 7—Adjusting Tone Arm Lowering Screw

(4) Needle Fails to Clear Record After Playing—Failure of the needle to clear the record surface on the return of the tone arm is caused by too loose adjustment of the cable tension. Adjust this tension as described in No. 3 above.

(5) Failure of Record to Deposit on Turntable—Incorrect lowering of the record onto the turntable may be caused by:

(a) *Improper Turntable Spindle Height*—The height of the turntable spindle nose should be $\frac{1}{32}''$ above the inside bottom surface of the record magazine. Adjustment of this height made by means of the screw at the bottom of the motor. (See Figure 9.)

(b) *Improper Setting of Magazine*—The horizontal swing of the magazine should be so adjusted when the mechanism is out of cycle that the outer surface at its nearest point to the nearest side of the turntable spindle is $5\frac{1}{32}''$. This can be done by loosening the two screws as shown in Figure 10, moving the magazine to its correct position and retightening the screws.

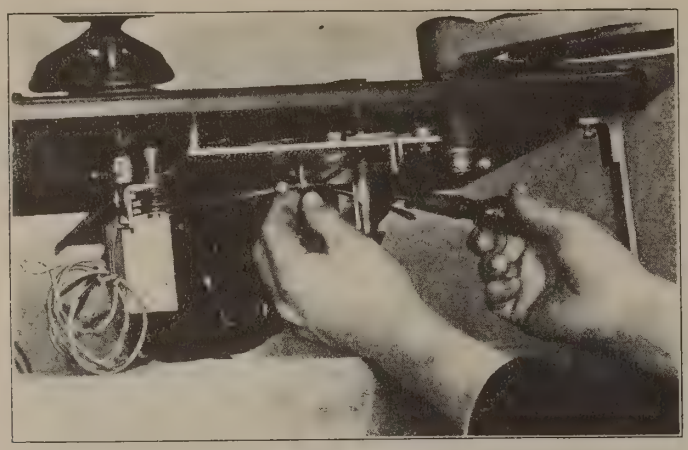


Figure 8—Adjusting Cable Tension Screw

(c) *Improper Setting of Record Locating Plate*—The small plate on top of the motor board at the left side of the turntable should be so adjusted that it will be depressed approximately $\frac{1}{32}''$ when the magazine swings over the turntable. When this adjustment is made correctly, the locating plate will engage the bottom record in the magazine as the latter is swinging back into the playing position. A small adjusting screw and lock nut are provided for this adjustment. (See Figure 11.)

(d) *Weak Spring in Turntable Spindle*—The spring inside the turntable spindle which holds up the spindle nose will cause the records to align improperly with the turntable spindle if the spring tension is too weak or if the spindle nose is sticking inside the spindle. Access to the spring for stretching its coils or for replacement can be had by driving out the small pin in the spindle nose, and lifting out the latter.

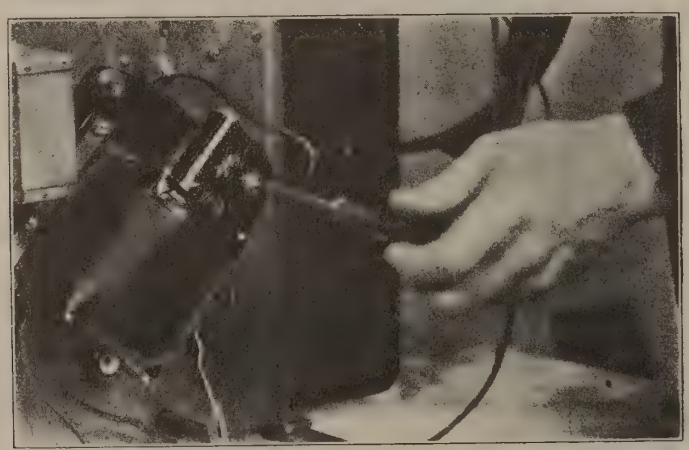


Figure 9—Adjusting Turntable Spindle Height

(6) **Records Discharge Improperly from Turntable**—Failure of the record on the turntable to be removed properly and placed in the magazine can be caused by:

(a) *Improper Horizontal Adjustment of Elevator Pads*—The elevator pads 13, Figure 1, should be so adjusted that the inside of the pad flange is $5\frac{1}{16}''$ from the nearest side of the turntable spindle. Loosen the screw on top of the elevator shaft, move the pad to its correct position as shown in Figure 12, holding both the pad and the elevator shaft in position,

and retighten the screw. Care should be observed that the ridge in the elevator shaft is not turned against the slot in the elevator shaft actuating lever so as to cut the latter. In some cases, it may be necessary to grip the shaft with padded pliers while this adjustment is being made in order to prevent the shaft from turning.

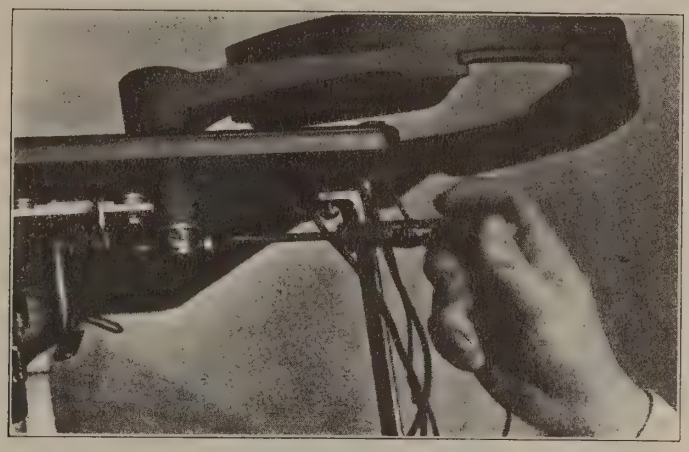


Figure 10—Adjusting Magazine

NOTE—If for any reason the elevator pads have been removed, always place the one with the rubber surface toward the front of the mechanism when replacement is being made.

(b) *Improper Adjustment of Elevator Shafts*—The elevator shafts 21, Figure 2, should rise to such a height as to give $\frac{3}{32}''$ clearance between the lowest surface of the elevator pad bottom and the top of the empty magazine. This adjustment can be made by means of the screw and lock nut as shown in Figure 13.

(7) **Failure to Trip on Eccentric Groove**—Failure of the mechanism to change records when the eccentric groove is reached may be caused by:

(a) *Improper Setting of Latch Plate*—Adjust the latch plate 49, Figure 4, by means of a small offset screw driver such as Stock No. 2930, as shown in Figure 14 until it makes proper contact with the latch trip when the eccentric groove is reached.

Figure 11—Adjusting Record Locating Plate

(b) *Weak Spring on Trip Lever*—A weak spring on the trip lever will be a cause of failure to trip.

(8) **Inability to Set for Manual Operation**—The manually operated lever 8, Figure 1, should set in its back position so as to free the tone arm and prevent the mechanism from tripping. This change from automatic to manual operation should be made only when the mechanism is out

of its cycle, otherwise the mechanism will reject continuously. The back position of the lever should be such that the end of the lever causes the latch trip to clear the latch plate by $\frac{1}{32}''$. An incorrect setting of the latch plate may cause the trip lever to clear the plate at one position of the tone arm, but to make contact with the plate at some other position of the tone arm.

(9) Failure to Start—Failure of the mechanism to start may be caused by:

(a) No power from electrical outlet.

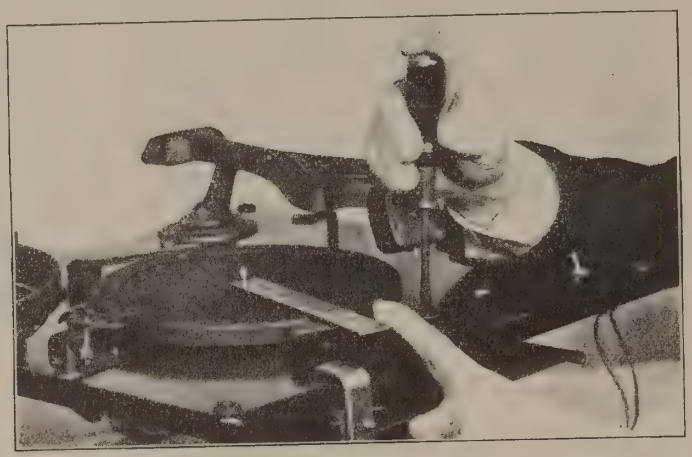


Figure 12—Adjusting Horizontal Position of Elevator Pads

(b) Faulty plug connections.
(c) Faulty switch connections.
(d) Open in 1.4 mfd. motor condenser wiring or connections.
(e) Faulty power wiring or connections.
(f) Faulty motor.

(10) Failure to Stop—Failure of the mechanism to stop after the "off" button has been pressed, and the mechanism has completed its cycle is caused by improper setting of the secondary stop switch 39, Figure 4. The switch body should be so mounted that the contacts will open $\frac{1}{64}''$ when the cycle is completed, but will close as soon as the mechanism is tripped.

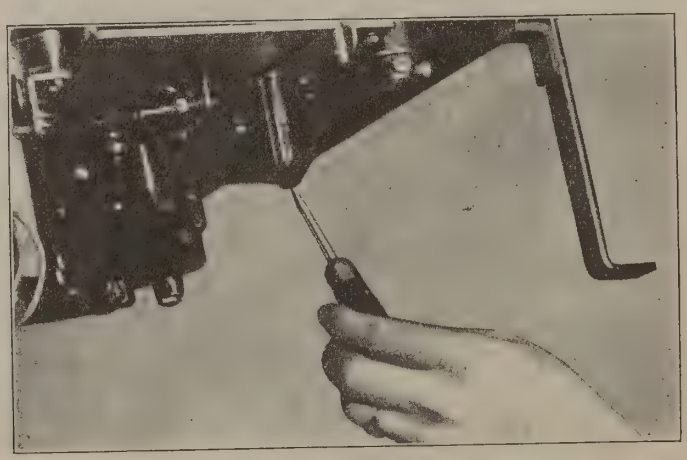


Figure 13—Adjusting Elevator Shafts

(11) Continued Tripping of Mechanism—This condition may be caused by:

(a) Manually operated lever 8, Figure 1, set for non-automatic operation during cycle.
(b) Improper setting of latch plate 49, Figure 4.
(c) Improper timing of the gears and associated parts. See Subject 13 below for the correct method of retiming.

(12) Clutch Slipping—Slipping of the clutch when the mechanism is passing through its cycle, causing a loud clicking noise, may be caused by:

(a) *Weak Spring on Pawl Carrier*—Remove the spring 36, Figure 4, and increase its tension by removing two or three coils.

(b) *Turntable Spindle Shaft Too Low*—This condition will cause binding between the pawl carrier and the clutch wheel. Raise the spindle as shown in Figure 9.

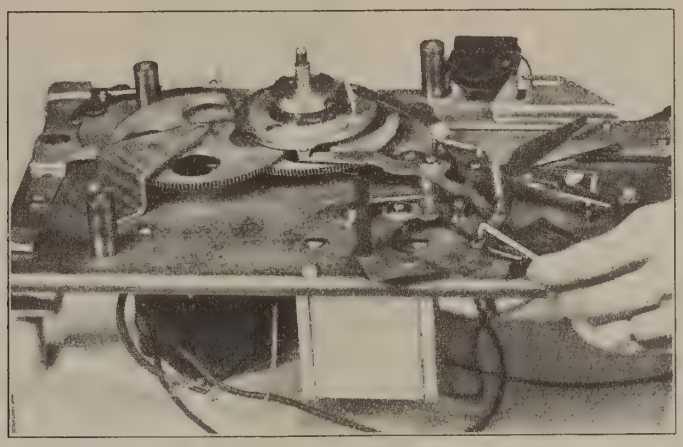


Figure 14—Adjusting Latch Plate

(c) *Binding in Any of the Moving Parts*—Such binding may be in the s'ide, the magazine, the elevator shafts, or the gears. The slide rollers at the left are mounted on eccentric shafts for adjustment of play. These may be so regulated as to cause excessive binding of the slide. Examine all of these parts carefully, and take any necessary steps to relieve the binding.

(13) Retiming the Mechanism—Should it be necessary to retime the mechanism after replacing certain of the parts, or because of continued tripping, proceed in the following manner:

(a) Allow the mechanism to operate until the slide 30, Figure 4, is in its extreme forward position. When this setting is reached the straight side of the cam 54, Figure 4, will be parallel with the side of the slide.

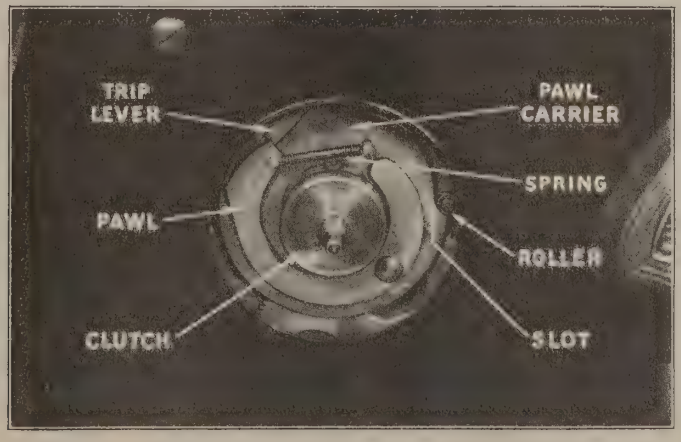


Figure 15—Proper Timing Position

Check the position of the trip lever and roller at this time to see that they are approximately as shown in Figure 15. If the various parts are not in their proper relation, the mechanism should be retimed.

(b) Loosen the set screw in the clutch wheel 35, Figure 4, and lift the wheel from the turntable spindle.

(c) Lift the pawl carrier 55, Figure 4, until it disengages from the gears.

(d) Lower the pawl carrier into mesh with the gears so that the trip lever is touching the end of the pawl as shown in Figure 15, when the cable lever roller is engaged in the slot on the side of the pawl carrier as shown.

(e) Recheck to see that the straight side of the cam is parallel with the slide.

(f) Replace the clutch wheel, and retighten the set screw, making sure that the set screw fits into the spot on the turntable spindle.

(14) **Removing Motor Board**—Should it be necessary to remove the motor board from the mechanism for replacement of any of the parts, the following procedure should be used:

(a) Remove nuts and washers from the through bolts which hold the motor board to the cabinet, and disconnect the pickup leads and power wiring to the mechanism; then lift the mechanism from the cabinet.

(b) Loosen the two set screws, and remove the magazine lever, 23, Figure 2.

(c) Lift out magazine.

(d) Unhook tone arm cable from spring 18, Figure 2.

(e) Loosen the two set screws in the tone arm lever 15, Figure 2.

(f) Remove the three small screws in the tone arm base, taking care not to lose the lock nuts.

(g) Disengage the tone arm lever from the tone arm shaft, and carefully lift the tone arm from the motor board, bringing the tone arm lever and the shielded cable up through the tone arm base hole in the motor board.

(h) Remove the screws and lock nuts in the bottom of the elevator shafts, 20, Figure 2.

(i) Lift elevator shafts from mechanism.

(j) Unfasten wires from motor board.

(k) Remove the four motor board screws which support the bottom plate.

(l) Carefully lift the motor board from the mechanism.

Access can now be had to all of the parts on the bottom plate. The parts can be reassembled in the reverse order from that given above. It will then be necessary to make various adjustments after the parts have been reassembled.

(15) **Lubrication**—The mechanism will seldom require lubrication. The motor gears run in grease. Unless gear replacements are made, it should not be necessary to relubricate this section. RCA Victor motor oil should be placed in the oil wells at each end of the motor occasionally. Wicks in these wells hold sufficient oil for normal operation from six months to one year. Oil should also be placed on the gear bearings, visible when the turntable is removed, and on the elevator shafts. RCA Victor motor grease should be placed on the slide and the mechanism gears once every six months.

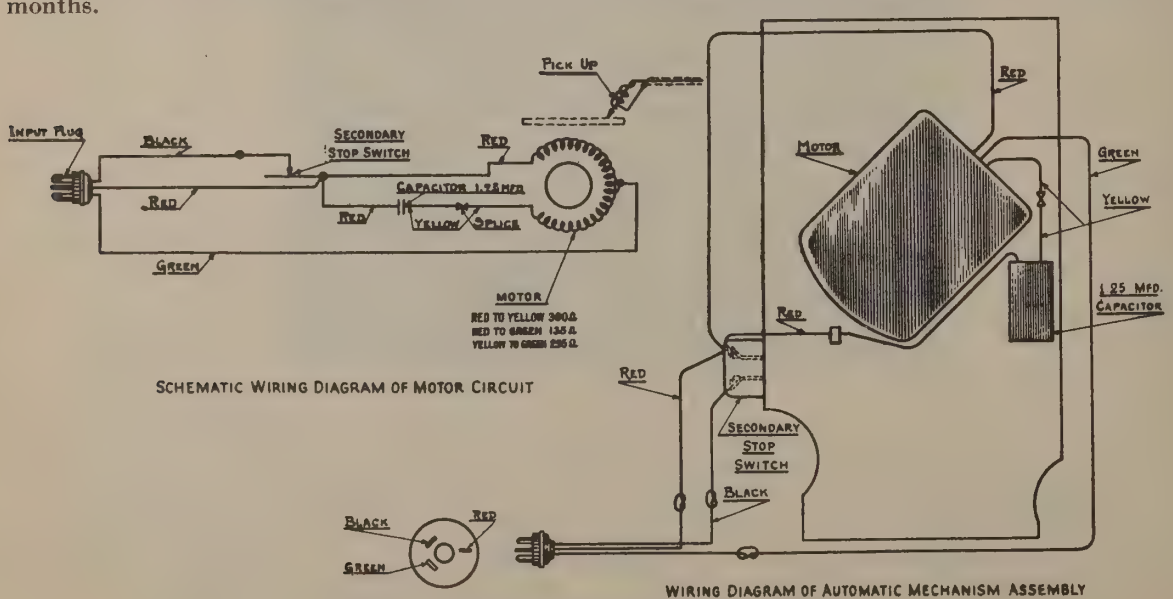


Figure 16—Wiring Diagram of Automatic Mechanism

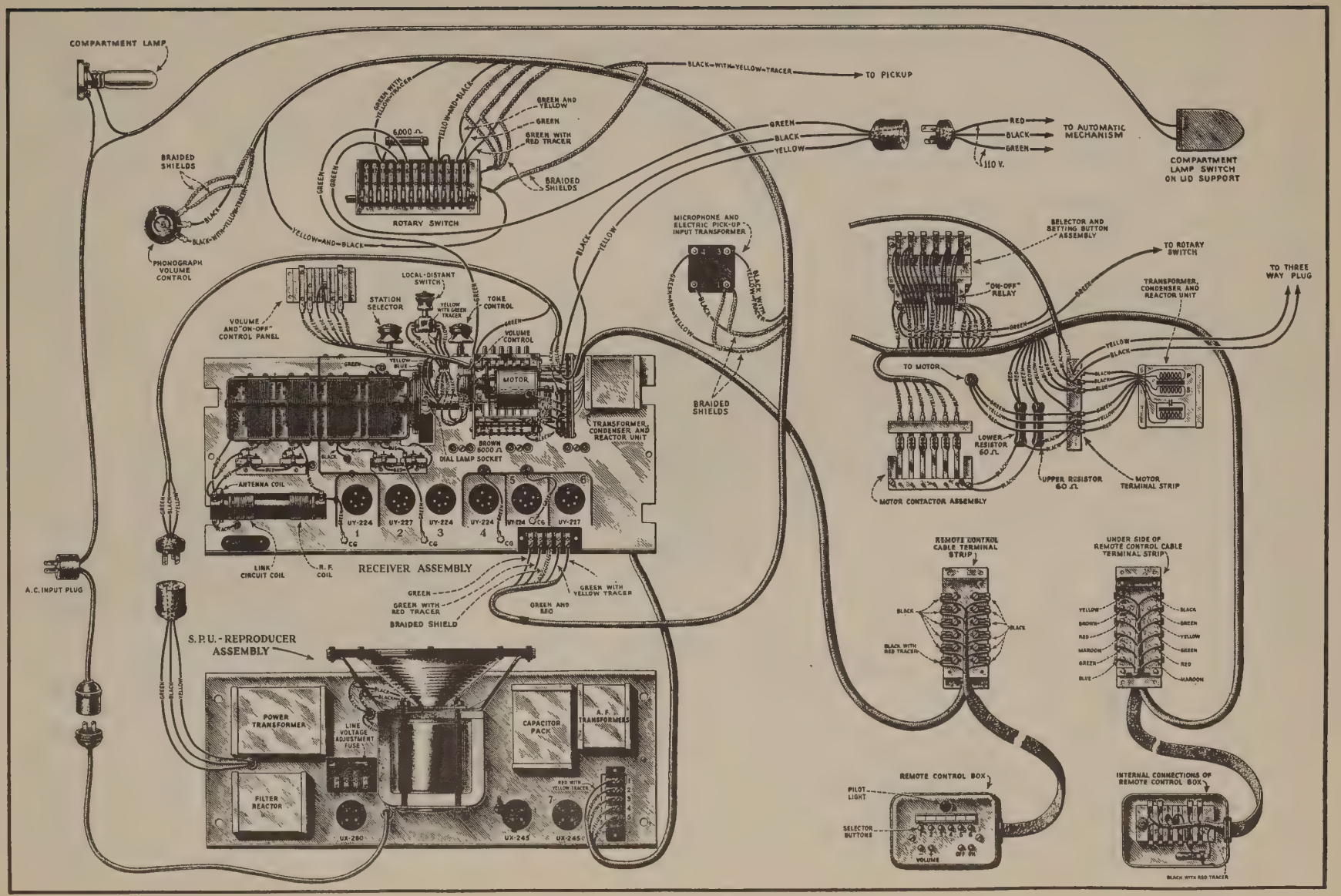


Fig. 17—Wiring Diagram of Model RAE-68

TRADE MARKS REG. U.S. PAT. OFF.
MARCAS REGISTRADAS

S. O. 7783—15M—4-15-'31.

Instructions for

RCA Victor R-70

Radiola

INSTALLATION

Preliminary—After unpacking the instrument, remove the packing material from the Radiotrons. Refer to the tube location diagram on rear of receiver, and ***make certain:***

(a) That all tubes are in the proper sockets and pressed down firmly.

(b) That all shields are rigidly in place over the Radiotrons shown by double circles on the diagram.

(c) That the short flexible leads shown on the diagram are attached to the top grid contacts of the proper Radiotrons as indicated, and that the spring contact caps are pressed down firmly.

(d) That the lid is securely in place on the shield of the RCA-58 Radiotron designated by the heavy circle on the diagram.

Location—The instrument should be located close to the antenna lead-in and ground connections, and near an electrical outlet.

External Connections—Figure 1 shows the external connections and recommended antenna system. It is essential that a good ground connection be provided. Make connections to the antenna and ground as illustrated. Then connect the power cord to an electrical outlet supplying alternating current at the voltage and frequency (cycles) for which the instrument is rated (see rating label on rear of receiver).

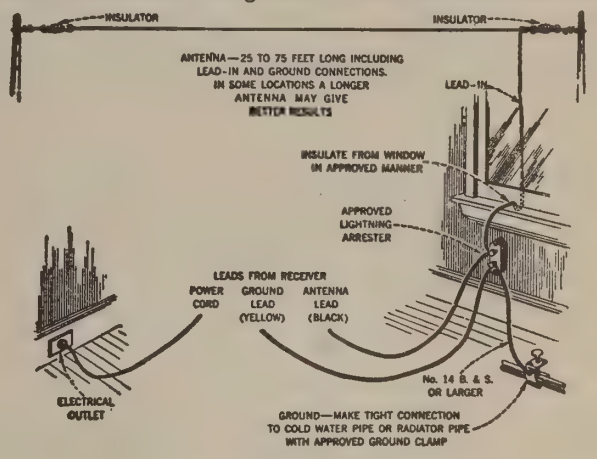

INSULATOR
INSULATOR
ANTENNA—25 TO 75 FEET LONG INCLUDING LEAD-IN AND GROUND CONNECTIONS. IN SOME LOCATIONS A LONGER ANTENNA MAY GIVE BETTER RESULTS
LEAD-IN
INSULATE FROM WINDOW IN APPROVED MANNER
APPROVED LIGHTNING ARRESTER
LEADS FROM RECEIVER
POWER CORD
GROUND LEAD (YELLOW)
ANTENNA LEAD (BLACK)
No. 14 B. & S. OR LARGER
ELECTRICAL OUTLET
GROUND—MAKE TIGHT CONNECTION TO COLD WATER PIPE OR RADIATOR PIPE WITH APPROVED GROUND CLAMP

Figure 1

IMPORTANT—Before operating make sure that the thick cardboard shipping spacer has been removed from under chassis and that the four bolts which extend through bottom of cabinet have been loosened sufficiently to allow the chassis to float freely on its rubber cushions.

OPERATION

The operating controls are shown in Figure 2. Proceed as follows:

1. Apply power by turning the Tone Control knob clockwise from the "off" position; set this control near the middle of its range. Several seconds are required for the Radiotrons to heat before satisfactory reception is possible.

Figure 2

2. Advance the Volume Control about one quarter turn from the extreme counter-clockwise position and turn the Station Selector in either direction until a station is heard. (The dial scale is calibrated in kilocycles to facilitate selecting stations of known frequency.) If no station is heard, advance the Volume Control further in a clockwise direction and again rotate the Station Selector.

3. After receiving a signal, turn the Volume Control counter-clockwise until the volume is reduced to a low level. Now readjust the Station Selector accurately to the position mid-way between the points where the quality becomes poor or the signal disappears. ***This setting minimizes the proportion of background noise and provides the fine quality of reproduction possible with this instrument.***

4. Adjust the Volume Control to secure the desired volume.

5. Adjust the Tone Control to obtain the desired tone quality, or turn it counter-clockwise to reduce noise interference.

6. When through operating, switch off the power by turning the Tone Control knob to the extreme counter-clockwise position.

Radiotrons—Improved results may sometimes be obtained by interchanging Radiotrons of the same type, either RCA-56 or RCA-58. *The power should be switched off before removing any Radiotron from its socket.* Spare Radiotrons should be kept on hand.

SERVICE DATA

Electrical Specifications

Voltage Rating.....105–125 Volts
Power Consumption.....85 Watts

Radiotrons Required
3 RCA-58, 2 RCA-56, 1 RCA-247, 1 UX-280—Total 7
Undistorted Output.....2.25 Watts
Intermediate Frequency.....175 K. C.
R. F. and Oscillator Line-up Frequency.....1400 K. C. Only

This receiver is a seven tube Super-Heterodyne receiver incorporating such features as new high efficiency Radiotrons, Pentode Output Stage, continuously variable tone control and the inherent sensitivity, selectivity and tone quality of the Super-Heterodyne.

Service work in conjunction with this receiver will be similar to that of other Super-Heterodyne receivers. Line-up adjustments are made with a modulated oscillator and output meter. The I. F. amplifier consists of an untuned transformer and one tuned transformer. The I. F. frequency is 175 K. C. and the line-up capacitors should be adjusted for maximum output at this frequency. The three gang capacitor trimmers are adjusted for maximum output when the dial and oscillator are both set at 1400 K. C.

Figure A shows the loudspeaker wiring, Figure B the schematic wiring and Figure C, the chassis wiring. The voltage readings are given on the next page and the replacement parts below.

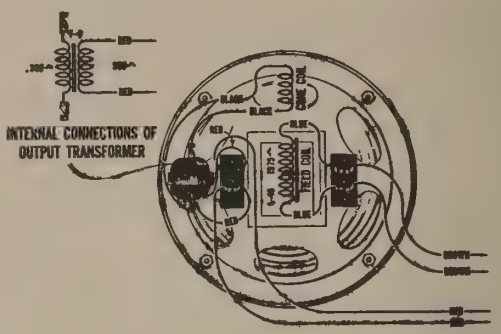


Figure A—Loudspeaker Wiring

REPLACEMENT PARTS

(Replacement parts may be purchased from authorized Distributors or Dealers Only)

Stock No.	DESCRIPTION	List Price
	RECEIVER ASSEMBLIES	
2532	Capacitor—230 mmfd.—Package of 5	$3.15
2746	Socket—Dial lamp socket	.50
2747	Cap—Contact cap—Package of 5	.50
2749	Capacitor—2,400 mmfd.	1.50
3048	Resistor—500,000 ohms—Carbon type—½ watt—Package of 5	2.50
3076	Resistor—1 megohm—Carbon type—½ watt—Package of 5	2.50
3077	Resistor—30,000 ohms—Carbon type—½ watt—Package of 5	2.50
3078	Resistor—10,000 ohms—Carbon type—½ watt—Package of 5	2.50
3461	Coil—Second detector plate choke coil	.88
3462	Resistor—2,500 ohms—Carbon type—1 watt—Package of 5	1.10
3463	Resistor—6,500 ohms—Carbon type—1 watt—Package of 5	1.10
3464	Resistor—70,000 ohms—Carbon type—½ watt—Package of 5	1.00
3469	Resistor—2,500 ohms—Carbon type—1 watt—Package of 5	1.10
3470	Resistor—6,500 ohms—Carbon type—1 watt—Package of 5	1.10
3471	Capacitor—0.025 mfd.	.32
3472	Capacitor—0.0024 mfd.	.32
3490	Screw assembly—Chassis mounting screw assembly comprising 4 screws, 4 washers and 4 spacers—1 set	.50
3495	Capacitor—320 mmfd.	2.00
6142	Resistor—6,000 ohms—Carbon type—¼ watt—Package of 5	.50
6192	Spring—3 gang tuning capacitor drive cord tension spring—Package of 10	1.50
6288	Knob—Station selector—Volume control or tone control knob—Package of 5	1.00
6298	Cord—3 gang variable tuning capacitor drive cord—Package of 5	.55
6300	Socket—4 prong Radiotron socket	2.50
6303	Resistor—20,000 ohms—Carbon type—½ watt—Package of 5	2.50
6312	Capacitor—650 mmfd.—Oscillator series—Package of 5	1.00
6318	Resistor—10,000 ohms—Porcelain type—20 watts	1.34
6372	Volume control	1.06
6373	Coil—R. F. coil complete	2.14
6374	Coil—Detector and oscillator coil	

Stock No.	DESCRIPTION	List Price
6375	Transformer—Second Intermediate frequency transformer	$1.88
6376	Transformer—First intermediate transformer	2.12
6377	Shaft—Tuning capacitor drive shaft with one flat washer and two "C" washers	.32
7484	Socket—UY type Radiotron socket	.65
7485	Socket—Radiotron 6 contact socket	.70
7501	Capacitor—3 gang variable tuning capacitor complete with mounting screws	5.20
7510	Shield—Radiotron tube shield—Maroon finish	.50
7522	Tone control	1.90
7557	Scale—Dial and dial scale	.80
7558	Transformer—Interstage audio transformer in metal container	2.48
7559	Capacitor pack—Comprising one 0.05 mfd., one 0.5 mfd., one 10.0 mfd., one 8.0 mfd., one 0.1 mfd., one 1.0 mfd. and three 0.1 mfd. capacitors in metal container	6.70
7560	Transformer—Power transformer—105–125 volts—50–60 cycles	6.14
7570	Transformer—Power transformer—105–125 volts—25–40 cycles	7.40
7571	Transformer—200–250 volts—50–60 cycles	6.28
	REPRODUCER ASSEMBLIES	
3005	Screw assembly—Comprising 4 screws, 8 nuts, 4 washers, and 4 eyelets—Package of 1 set	.50
6184	Board—Terminal board with 3 terminals—Package of 5	.50
6378	Transformer—Output transformer	1.94
8920	Ring—Cone retaining ring	.50
8935	Cone—Reproducer cone complete with voice coil—Package of 5	12.50
9422	Coil assembly—Comprising field coil, magnet and cone support	4.32
	CABINET ASSEMBLIES	
6113	Foot—Felt foot—Package of 15	
7437	Escutcheon—Tuning selector escutcheon	
X190	Cabinet—Complete less all equipment	
X191	Baffle board and grille cloth	
	PARTS SPECIAL FOR NURSERY MODEL	
3492	Knob—Blue knob	.30
3493	Knob—Red knob	.30
3494	Knob—Orange knob	.30
X194	Escutcheon—Station selector escutcheon—Red finish	
X195	Baffle board and grille cloth	
X196	Cabinet—Cabinet complete less all equipment	

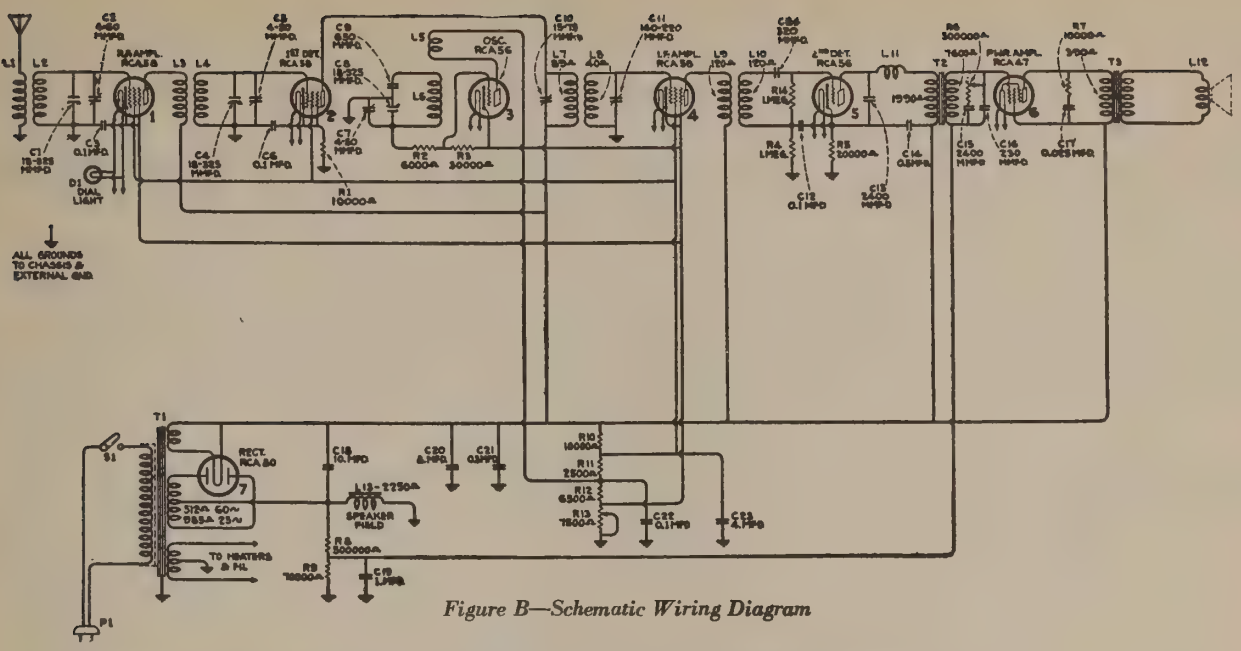


Figure B—Schematic Wiring Diagram

RADIOTRON SOCKET VOLTAGES

All Voltages Measured at Maximum Volume with No Signal Impressed on Input. 120 Volt 60 Cycle A. C. Source Used

Radiotron No.	Cathode or Filament to Control Grid Volts	Cathode or Filament to Screen Grid Volts	Cathode or Filament to Plate Volts	Plate Current M. A.	Heater or Filament Volts
1. R. F. RCA-58	4.5	100	245	6.0	2.37
2. Oscillator RCA-56	—	—	60	4.5	2.37
3. First Detector RCA-58	13.0	90	235	1.3	2.37
4. I. F. RCA-58	4.5	100	245	6.0	2.37
5. Second Detector RCA-56	18.0	—	230	1.0	2.37
6. Power RCA-247	16.5	250	240	30.0	2.37
7. Rectifier UX-280	370 Volts R. M. S. each plate			70.0	5.0

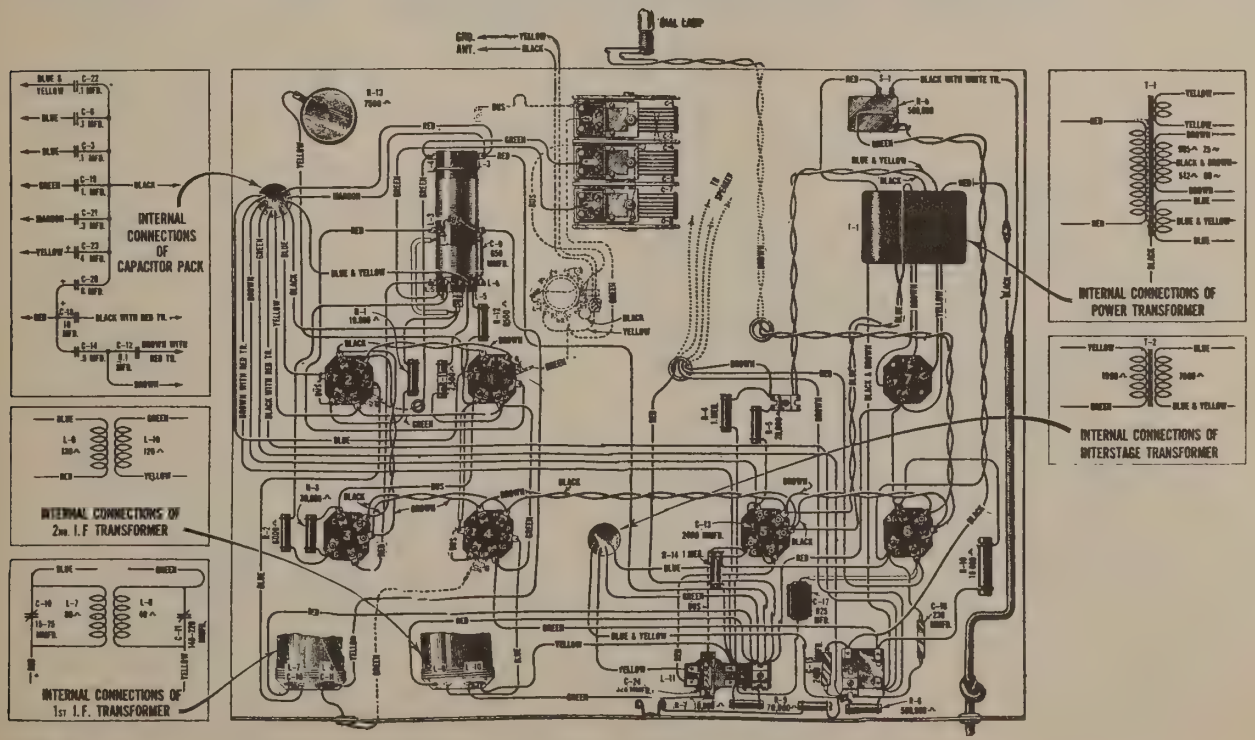

INTERNAL CONNECTIONS OF CAPACITOR PACK
INTERNAL CONNECTIONS OF 2nd I.F TRANSFORMER
INTERNAL CONNECTIONS OF 1st I.F. TRANSFORMER
INTERNAL CONNECTIONS OF POWER TRANSFORMER
INTERNAL CONNECTIONS OF INTERSTAGE TRANSFORMER

Figure C—Chassis Wiring Diagram

TRADE MARKS REG. U. S. PAT. OFF.

RCA Victor Company, Inc.

Camden, N. J., U. S. A.

23109
S. O. 759587 2M

Printed in U. S. A.

SERVICE NOTES
for
RCA Victor Radiola Electrola, RE-73

RCA Victor Radiola Electrola RE–73 is an eight tube screen grid tuned R. F. type radio receiver combined with a standard Electrola mechanism. The receiver assembly and amplifier of this model is similar to that used in the 1930 Victor Receivers, Models R–35, R–39, and RE–57. The loudspeaker used is similar to that employed in the RCA Victor Superette R–7.

A reference to Victor Service Bulletin No. 26 will give the details of any service work required in conjunction with the receiver or amplifier. A reference to the RCA Radiola 86 Service Notes will give the details of any service work necessary in conjunction with the motor board assembly.

Figure 1 shows the schematic diagram of the motor board connections and Figure 2 shows the motor board wiring.

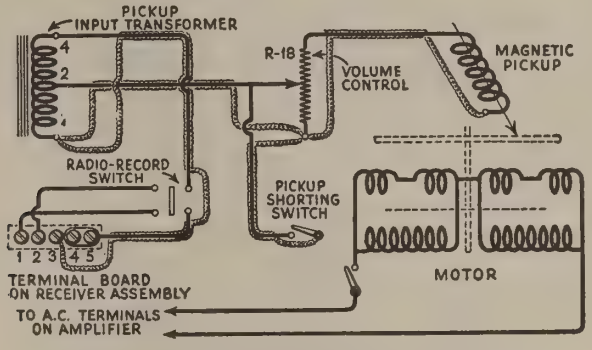


Figure 1—Schematic Diagram of Motor Board

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
	RECEIVER ASSEMBLY	
2012	Condenser—1200 MMFD. condenser	$0.55
2546	Resistor—1 megohm—Carbon type resistor—Package of 5	3.00
2746	Socket—Dial lamp socket	.50
2747	Cap—Contact cap—Package of 5	.50
2748	Posts—Twin binding posts with lock washers and nut—Antenna and ground	.50
2804	Knob—Volume or station selector knob—Package of 5	2.50
2966	Resistor—28,000 ohm—Carbon type—Package of 5	2.50
2970	Resistor—½ megohm—Carbon type—Package of 5	2.50
7124	Socket—UY Radiotron socket	.80
7303	Dial—Station selector dial scale—Package of 5	3.00
10426	Screw—Cam wheel adjusting screw—Package of 20	.50
10805	Shield—Round condenser shield	.75
10806	Shield—Variable condenser shield	1.50
10807	Shield—White enamel lamp shield	.60
10808	Indicator—Dial indicator—Package of 5	.50
10809	Plate—Cover plate with screw—Package of 5	.50
10810	Roller—Cam roller—Package of 5	.50
10811	Condenser—Variable condenser	3.50
10812	Shaft—Cam roller shaft with washer and nuts—Package of 2	.50
10813	Control—Tone control with plate washers and nut	1.60
10814	Shield—Filter coil and capacitor shield with washers and nuts—Package of 2	.60
10815	Coil—Filter coil and capacitor with mounting screws, lock washers and nuts	$1.50
10816	Coil—3rd R. F. coil	1.60
10817	Coil—Link coil	1.50
10818	Condenser—Bank of two condensers—0.25 and 0.75 mfd.	1.80
10819	Condenser—Bank of three condensers—Three 0.1 mfd.	1.80
10820	Condenser—100 mmfd. condenser	.50
10821	Coil—Resistor board coil	.80
10822	Wheel—Cam wheel with spring washers, cup washer and pin	2.60
10824	Strip—Terminal strip with insulation and rivet—Two contact	.50
10825	Inductor—Stabilizing inductor with screw, lock washer and nut	2.20
10826	Control—Volume control with nut, washer and locking plate	2.50
10828	Coil—Antenna coupling coil	1.50
10829	Coil—1st R. F. coil	1.60
10830	Coil—2nd R. F. coil	1.60
10831	Strip—Terminal strip with link	.70
10832	Socket—UX Radiotron single socket with insulator	.60
10833	Strip—Terminal strip with insulation and rivets—Six contacts	.70
10834	Clip—Tube socket clips—Package of 10	.50
10835	Capacitor—0.01 mfd.	.50
10837	Capacitor—Bank of three 0.1 mfd. capacitors	.75

REPLACEMENT PARTS (Continued)

Stock No.	DESCRIPTION	List Price
	RECEIVER ASSEMBLY—Continued	
10838	Resistor—9000 ohms—Carbon type—Package of 5	$2.50
10839	Resistor—130 ohms—Carbon type—Package of 5	2.50
10840	Resistor—2800 ohms—Carbon type—Package of 5	2.50
10841	Resistor—1½ megohm—Carbon type—Package of 5	2.50
10842	Capacitor—10 mfd. condenser—Package of 2	.60
10843	Shield—Radiotron shield body with cap—Package of 1 set	.90
10844	Shield—Coil shield body with cap—Package of 1 set	.90
10851	Panel—Radio chassis escutcheon panel—Less dial	3.00
10920	Cable—Wiring cable—Used to connect receiver to amplifier	2.75
10948	Spring—Tuning condenser spring—Package of 5	.50
10949	Link—Tuning condenser link—Bakelite—Package of 5	.60
10969	Roller—Tuning condenser roller and shaft with eyelet screw and nut—Package of 5	.50
	S. P. U.	
2721	Socket—UX-245 Radiotron double socket with insulator and rivets	1.00
2722	Resistor—55 ohm—Mid-tapped—Wire wound—Filament resistor	1.00
2723	Switch—Operating switch—Toggle—With mounting nuts and washer—Package of 5	3.00
2757	Strip—Terminal strip—Two contact	.50
2880	Resistor—70,000 ohms—Carbon type—Package of 5	3.00
2963	Resistor—8,000 ohms—Carbon type—Package of 5	2.50
7053	Resistor—715 ohms—Wire wound	.70
7054	Cord—Amplifier power cord with male connector plug	1.00
7075	Socket—UX-280 Radiotron socket	1.80
7224	Cover—Fuse cover with bushing and insulator	.50
10845	Transformer—A. F. transformer	14.00
10907	Fuse—3 amperes—Package of 5	1.00
10908	Cover—Terminal strip cover—Package of 2	.50
10909	Condenser—Condenser bank—60 cycles	16.00
10910	Capacitor—Extra filter capacitor for 25 cycles	5.00
10911	Reactor—Filter reactor	4.50
10912	Strip—Terminal strip—8 contacts	.70
10913	Cable—Amplifier wiring cable	2.00
10915	Transformer—Power transformer—105–125 volts—25–40 cycles	16.00
10917	Transformer—Power transformer—105–125 volts—50–60 cycles	12.00
	PHONOGRAPH PARTS	
2614	Switch—Automatic brake contact switch	1.40
2615	Springs—Brake springs—Set of 4 springs—Package of 2 sets	.50
2620	Cushions—Pickup rubber cushion—Comprising 1 damper and 2 pivot cushions—Package of 5 sets	1.25
2622	Coil assembly—Located nearest governor—105–125 volts, 25 cycles—Comprising 2 current coils, 1 voltage coil, laminated core, end bracket, terminal board, nuts, bolts, screws and washers—Completely assembled ready for mounting	9.00
2623	Coil assembly—Located farthest from governor—105–125 volts, 25 cycles—Comprising 2 current coils, 1 voltage coil, laminated core and bracket, terminal board nuts, bolts, screws and washers—Completely assembled ready for mounting	9.00
2691	Governor—Comprising shaft with worm, brake disc, weights, springs and screws—Assembled	5.25
2692	Bearings—Governor shaft bearings—One set of 2	1.35
2693	Gear—Governor drive worm gear with set screw	1.35
2695	Bearings—Threaded thrust bearing with lock nut for end of turntable spindle	.50
2759	Box—Needle box with lid—Package of 2	.60
2765	Screw—Pickup needle holding screw—Package of 10	.80
2766	Screw—Pickup cover mounting screw—Package of 10	.50
2767	Spring—Pickup magnet spring—Package of 10	.50
2768	Armature—Pickup armature	.50
2770	Plate—Pickup damper plate—Package of 5	.50
2771	Screw—Pickup damper plate mounting screw—Package of 10	.50
2787	Switch—Pickup shorting switch	1.00
2789	Cord—Motor cord—Connects motor coil and starting switch	.60
2826	Cable—Shielded cable from shorting switch to record volume control	.50
2829	Knob—Motor board lifting knob and screw—Package of 2	$0.50
2858	Rest—Pickup rubber rest with mounting brad—Package of 5	.50
3052	Screw assembly—Pickup pole piece mounting screw, nut, washer—Package of 10 sets	.50
3101	Switch—Record-radio toggle switch with mounting nuts and escutcheon plate—Located on top of motor board	1.25
3102	Receptacle—Needle receptacle	.75
3158	Screw assembly—Motor mounting screw assembly—Comprising 3 screws, 3 bushings, 3 metal washers and 12 cushion washers	.80
3162	Regulator—Speed regulator with mounting screws—Comprising cam and shaft, bushing and bracket	.80
3163	Escutcheon—Speed regulator escutcheon with mounting screw—Package of 5	2.00
3164	Control—Record volume control with mounting washer and nut—Less knob	1.70
3167	Magnet—Pickup magnet	2.60
3168	Coil—Pickup coil	.85
3169	Shoe—Pickup pole shoe R. H.	1.45
3170	Shoe—Pickup pole shoe L. H.	1.45
6067	Lever—Speed control regulator lever for motor—Comprising lever, spring, mounting bolt, nut and washer	1.60
6069	Coil assembly—Located nearest governor—105–125 volts, 60 cycles—Comprising 2 current coils, 1 voltage coil, laminated core end bracket, terminal board, nuts, bolts, screws and washers—Completely assembled ready for mounting	8.40
6070	Coil assembly—Located farthest from governor—105–125 volts, 60 cycles—Comprising 2 current coils, 1 voltage coil, laminated core, end bracket, terminal board, nut, bolts, screws and washers—Completely assembled ready for mounting	8.40
7076	Brake—Automatic brake with mounting screws	4.50
7082	Support—Lid support complete with mounting screws	2.00
7083	Transformer—Input transformer	5.00
7084	Cover—Turntable cover	.50
7093	Cover—Pickup cover	.50
7151	Housing—Pickup housing back	.50
7304	Spindle—Turntable spindle	1.25
7306	Cable—Braided cable from volume control switch	1.80
7307	Pickup—Pickup unit complete	12.50
8732	Arm—Pickup arm and base complete with mounting screws—Less pickup unit	3.50
8733	Turntable—Turntable with cover	4.60
10175	Needle holder	.70
	REPRODUCER ASSEMBLY	
3166	Bolt assembly—Reproducer mounting bolt assembly—Comprising two bolts, two nuts, two lock washers and two plates	1.05
7308	Coil assembly—Reproducer field coil assembly—Comprising field coil, cone bracket and magnet	6.00
8559	Ring—Cone retaining ring	.80
8601	Cone—Reproducer cone with voice coil—Package of 5	15.00
	CABINET ASSEMBLY	
2785	Hinge—Lid hinge with mounting screws—Package of 1 set of 2	.50
3156	Label—Metal trade mark label—Package of 5	2.50
7300	Baffle board and grille cloth	1.50
7301	Escutcheon—Tuning dial control escutcheon	2.00
7302	Overlay—Top front frame overlay	1.20
8727	Stretcher	5.00
8728	Grille—Wood grille	3.75
8729	Moulding—Front bottom frame rail moulding	.90
8730	Foot	1.00
9377	Cabinet—Cabinet complete—Less equipment	65.00
9378	Post—Front post R. H.	3.50
9379	Post—Front post L. H.	3.50
9380	Post—Back post R. H.	3.25
9381	Post—Back post L. H.	3.25
9382	Panel—Control panel	6.00
9383	Lid	14.75
10925	Ornament—Post ornament—Package of 1 pair	.75

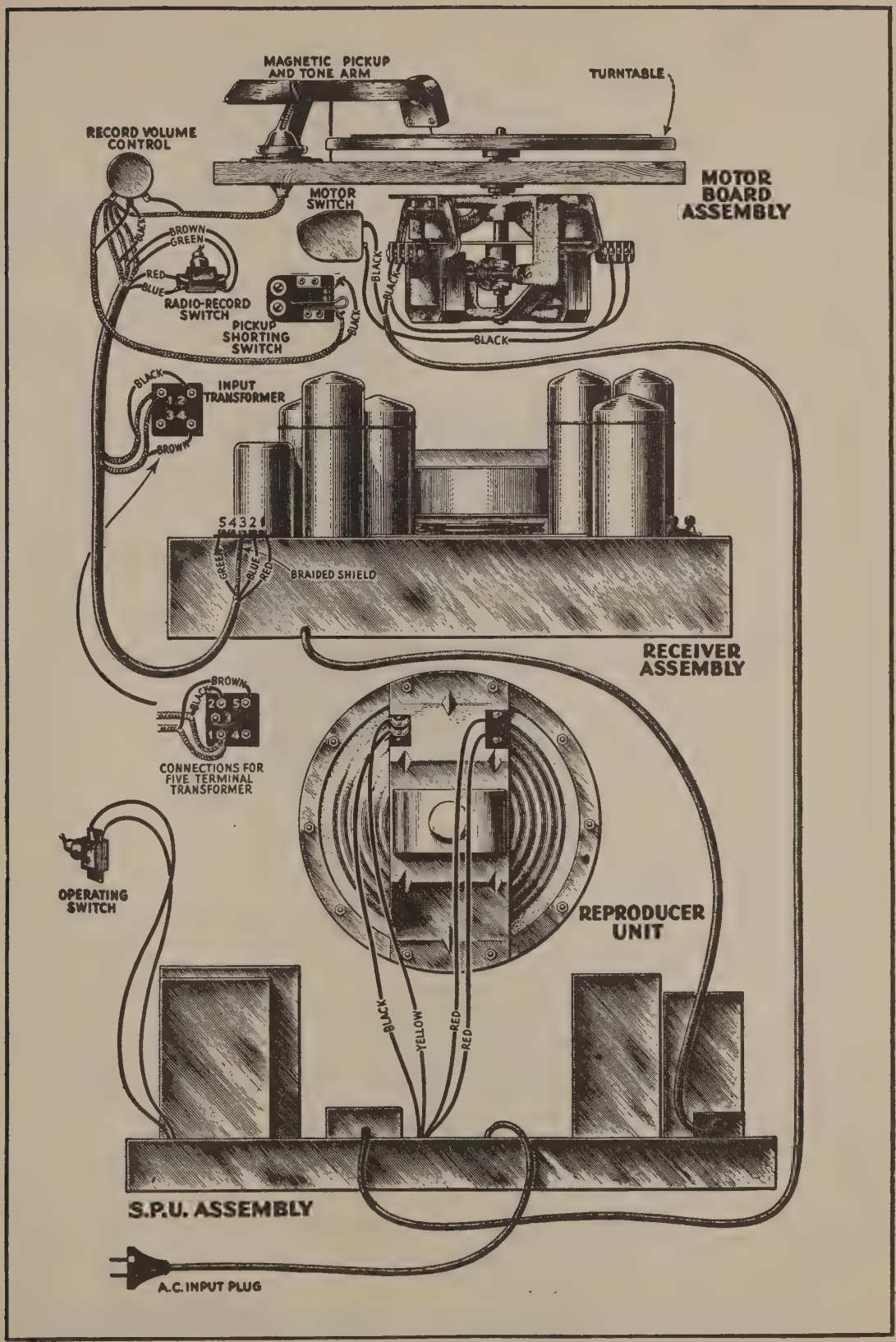


Figure 2—Assembly Wiring Diagram

SERVICE DIVISION

RCA Victor Company, Inc.

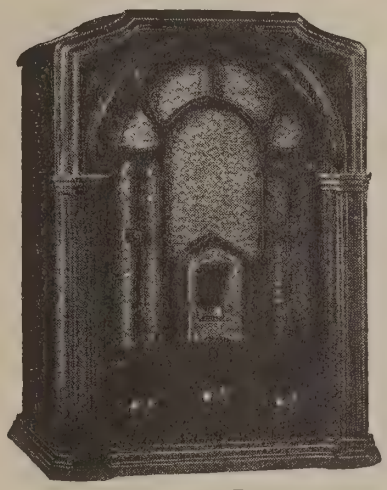
Camden, N. J., U. S. A.

S. O. 8350 20M—10-2-'31

RCA Victor

Models R-74, R-76 and R-77

SERVICE NOTES



RCA Victor R-74

[First Edition, 10M
Copyright, July, 1932]

SERVICE DIVISION

RCA Victor Company, Inc.

Camden, N.J.

A RADIO CORPORATION OF AMERICA SUBSIDIARY

REPRESENTATIVES IN PRINCIPAL CITIES

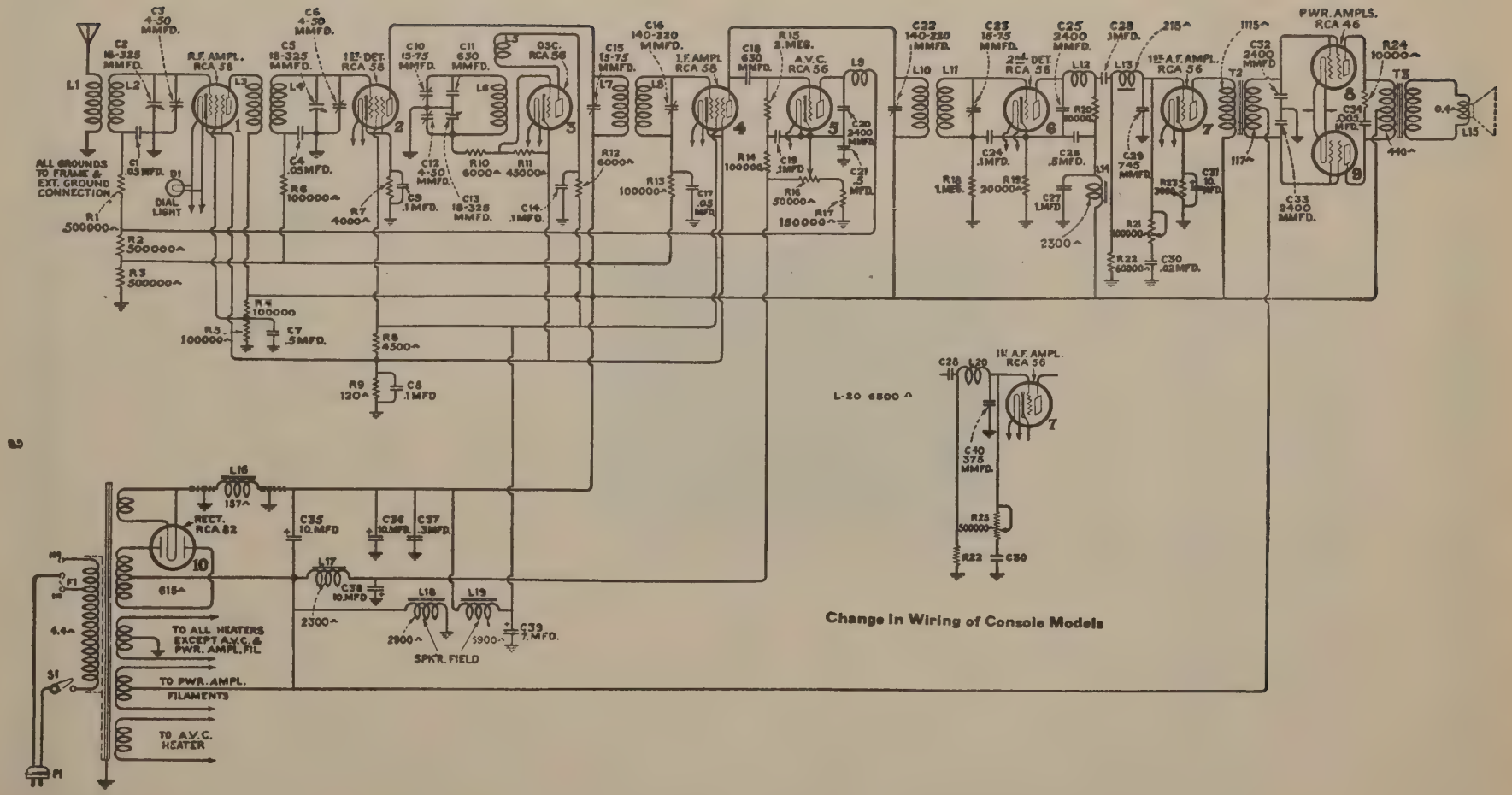

ALL GROUNDS TO FRAME & EXT. GROUND CONNECTION
DIAL LIGHT
R.F. AMPL. RCA 58
1ST DET. RCA 58
OSC. RCA 58
I.F. AMPL RCA 58
A.V.C. RCA 56
2ND DET. RCA 56
1ST A.F. AMPL. RCA 56
PWR. AMPLS. RCA 46
RECT. RCA 82
1ST A.F. AMPL. RCA 56
Change In Wiring of Console Models
TO ALL HEATERS EXCEPT A.V.C. & PWR. AMPL. FIL.
TO PWR. AMPL. FILAMENTS
TO A.V.C. HEATER
SPKR. FIELD

Figure 1—Schematic Circuit Diagram

SERVICE NOTES

for

RCA Victor Models R-74, R-76 and R-77

ELECTRICAL SPECIFICATIONS

Voltage Rating.....105–125 Volts
Frequency Rating.....50–60 Cycles
Power Consumption.....100 Watts Maximum
Recommended Antenna Length.....25–100 Feet
Type of Circuit.....Super-Heterodyne with A.V.C. and Class "B" Output Stage
Type and number of Radiotrons.....4 RCA-56, 3 RCA-58, 2 RCA-46, 1 RCA-82, Total 10
Number of R. F. Stages.....One
Number of I. F. Stages.....One
Number of A. F. Stages.....Two, One single and one Class "B" RCA-46
Type of A.V.C.....RCA-56 grid voltage supplied by output of I.F. controlling R.F., 1st detector and I.F. by drop across resistor in plate circuit of A.V.C. tube. Manual volume control adjusts grid bias voltage on A.V.C. tube.
Type of Second Detector.....Power Grid Bias
Type of Tone Control.....Variable resistance and capacitor for reducing high frequency output of 1st A. F. stage.
Type of Rectifier.....Mercury Vapor full wave RCA-82
Undistorted Output.....7.0 Watts

PHYSICAL SPECIFICATIONS

	R-74	*R-76*	*R-77*
Height	20 inches	40 inches	41 1/16 inches
Width	14 13/16 inches	23 5/16 inches	25 1/16 inches
Depth	11 3/16 inches	12 9/32 inches	13 5/16 inches
Weight Alone	44 Lbs.	71 Lbs.	82 Lbs.
Weight Packed for Shipment	54 Lbs.	93 Lbs.	118 Lbs.

RCA Victor Models R-74, R-76, and R-77 are ten tube Super-Heterodyne radio receivers employing such features as, continuously variable tone control, automatic volume control, Class "B" output amplifier and the inherent sensitivity, selectivity, and tone quality of all RCA Victor receivers. The R-74 is a table model, the R-76 an open face console while the R-77 is a door model console. Except for a slight difference in the console model to improve the fidelity, all models are similar and use the same chassis and loudspeaker.

The R. F. Circuit used in these receivers is identical with that used in Models R-71 and R-72. It uses the new improved automatic volume control and the new R. F. Pentode Radiotrons. The location of the manual volume control in the cathode circuit of the A. V. C. so that it varies the grid bias for different volume levels, gives improved A. V. C. action.

The audio amplifier consists of two stages, the first being a resistance coupled driver stage using a single RCA-56 and the second a transformer coupled Class B output stage. The undistorted output is approximately 7 watts, its exact maximum depending on the percentage of modulation of the incoming signal.

The RCA-82 rectifier is used to provide the necessary D. C. voltages for plate and grid requirements of the Radiotrons. It also gives the degree of regulation necessary for use with the Class B output amplifier. A low D. C. resistance reactor is used for filtering the rectified voltage used by the output stage. As this is of a highly varying current value, it cannot be used for loudspeaker field excitation. The loudspeaker field is therefore excited by using a double field coil. One section is a reactor for filtering the voltages used by all Radiotrons except the output stage. The other section is used to filter the screen grid supply and also to drop this voltage to a desired value. Together about 10 watts is obtained for field excitation.

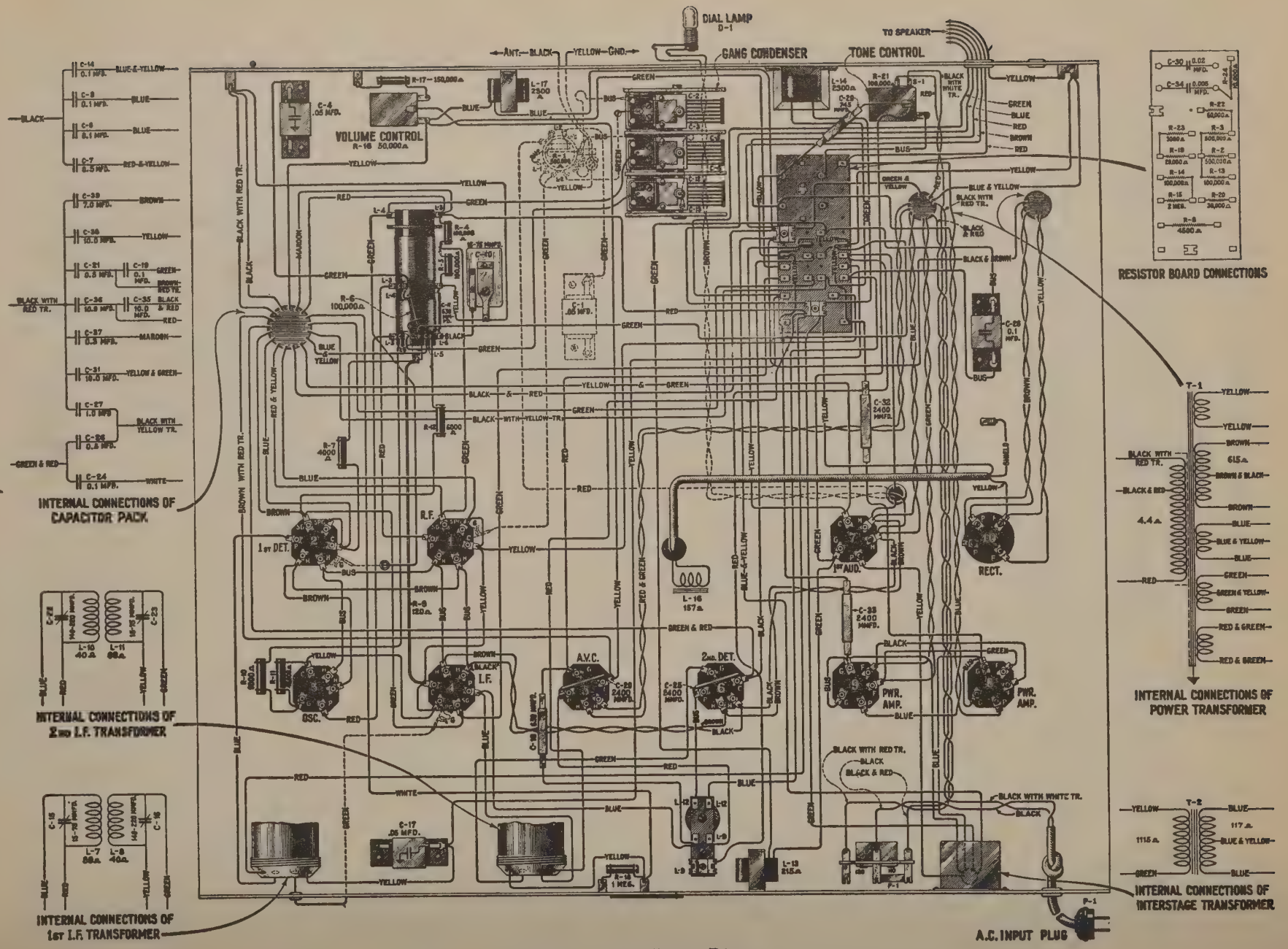


Figure 2—R-74 Wiring Diagram

SERVICE DATA

Service data in conjunction with these receivers will be found to be similar to that of other RCA Victor Super-Heterodyne receivers employing automatic volume control. A dummy Radiotron RCA-56 should replace the tube normally in the A. V. C. socket when making R. F., oscillator and I. F. adjustments. The Radiotron socket voltages are given below and the Replacement Parts on Pages 7 and 8.

Figure 1 shows the schematic diagram for all models. Figures 2 and 4 show the wiring diagrams while Figure 3 shows the loudspeaker wiring. Figures 5, 6, and 7 show various magnetic pickup connections and Figure 8 gives the correct manner of attaching the RCA Victor Short Wave Adaptor.

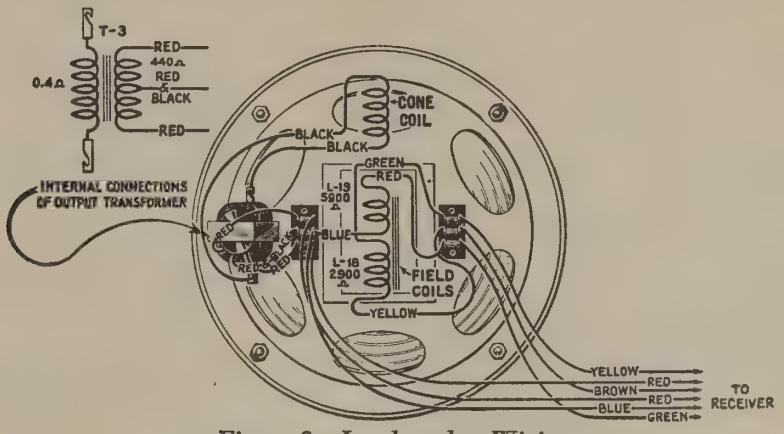


Figure 3—Loudspeaker Wiring

RADIOTRON SOCKET VOLTAGES

120 Volt A. C. Line

(No Signal Being Received—Antenna Lead Grounded to Chassis)

Radiotron No.	Cathode to Heater Volts, D. C.	Cathode or Filament to Control Grid Volts, D. C.	Cathode or Filament to Screen Grid Volts, D. C.	Cathode or Filament to Plate Volts, D. C.	Plate Current, M. A.	Heater or Filament Volts, D. C.
VOLUME CONTROL AT MINIMUM						
1. R. F.	+4	1.0	90	280	0	2.4
2. 1st Det.	0	1.2	90	275	0	2.4
3. Osc.	+4	0	—	55	5.0	2.4
4. I. F.	+3	1.8	90	280	0	2.4
5. A. V. C.	0	0	—	5	0	2.4
6. 2nd Det.	+15	3.0	—	225	1.0	2.4
7. 1st A. F.	+14	10.0	—	260	5.0	2.4
8. Power	—	0	—	400	6.0	2.4
9. Power	—	0	—	400	6.0	2.4
VOLUME CONTROL AT MAXIMUM						
1. R. F.	+4	0	70	250	4.5	2.4
2. 1st Det.	+6	0.6	75	235	2.0	2.4
3. Osc.	+4	0	—	50	5.0	2.4
4. I. F.	+4	1.5	84	250	4.5	2.4
5. A. V. C.	0	0	—	15	0	2.4
6. 2nd Det.	+15	3.0	—	210	1.0	2.4
7. 1st A. F.	+14	10.0	—	240	5.0	2.4
8. Power	—	0	—	400	6.0	2.4
9. Power	—	0	—	400	6.0	2.4

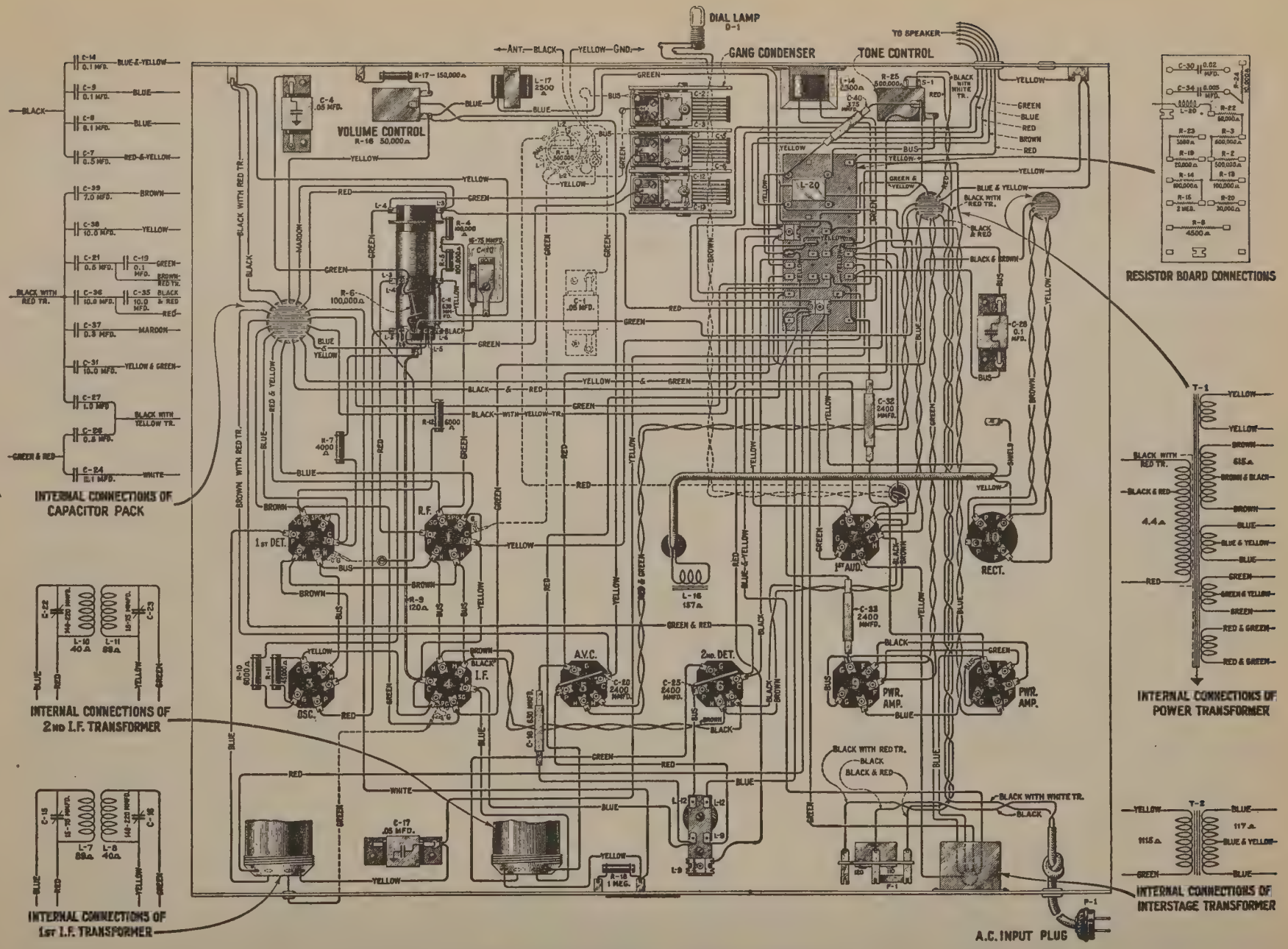


Figure 4—R-76 and R-77 Wiring Diagram

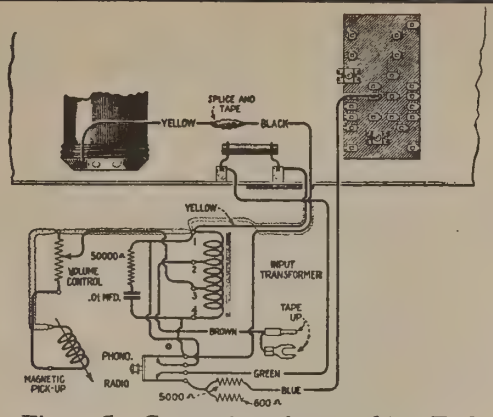


Figure 5—Connections for attaching End Table Model T-5

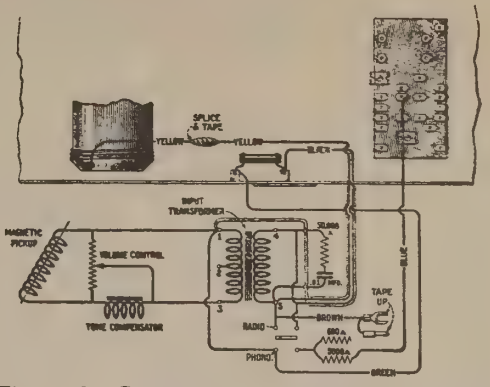


Figure 6—Connections for attaching Portable Turntable Model PT-33

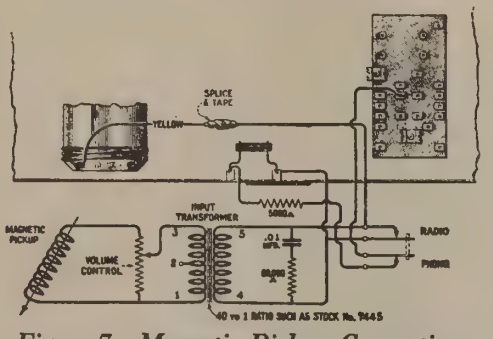


Figure 7—Magnetic Pickup Connections

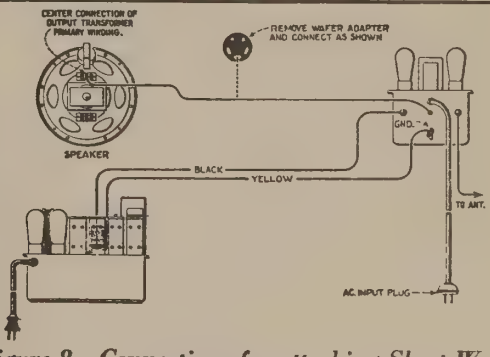


Figure 8—Connections for attaching Short Wave Adaptor Model SWA-2

REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
	RECEIVER ASSEMBLIES	
2725	Fuse — 1.5 Ampere — Cartridge type fuse—Package of 5	$0.50
2731	Resistor—10,000 ohms—Carbon type resistor 1 watt—Package of 5	2.00
2734	Capacitor — 745 mmfd. capacitor — Package of 5	2.20
2746	Socket—Dial lamp socket	.50
2747	Cap—Contact cap—Package of 5	.50
2749	Capacitor—2,400 mmfd. capacitor	1.50
3048	Resistor—500,000 ohms—Carbon type —½ watt—Package of 5	2.50
3055	Cushion—Sponge rubber chassis cushion support—One set of 4	.50
3056	Shield—Radiotron tube shield—Package of 2	.50
3076	Resistor—1 megohm—Carbon type—½ watt—Package of 5	2.50
3077	Resistor—30,000 ohms—Carbon type—½ watt—Package of 5	2.50
3099	Capacitor—.005 mfd. capacitor	.75
3252	Resistor—100,000 ohms—Carbon type resistor—½ watt—Package of 5	2.75
3358	Resistor—3,000 ohms—Carbon type—½ watt—Package of 5	2.50
3359	Resistor—120 ohms—Flexible wire type —Package of 5	1.25
3360	Resistor—150,000 ohms—Carbon type —½ watt—Package of 5	2.50
3368	Socket—UX type Radiotron socket	$0.50
3369	Resistor—4,500 ohms—Porcelain type —20 watt	1.00
3370	Capacitor—0.02 mfd. capacitor	.75
3372	Cover—Fuse cover	.50
3373	Board—Terminal board—1 terminal and insulator	.50
3374	Reactor—A. V. C. Filter reactor	2.00
3375	Reactor—Tone compensating reactor—For R-74 only	1.50
3376	Mounting board—Fuse mounting board complete with mounting screws and lockwashers—Less fuse	.60
3377	Coil—Choke coil	1.50
3378	Capacitor—375 mmfd. capacitor—For R-76 and R-77—Package of 5	2.50
6142	Resistor—6,000 ohms—Carbon type—½ watt—Package of 5	2.00
6186	Resistor—500,000 ohms—Carbon type —¼ watt	2.00
6188	Resistor—2 megohm—Carbon type—½ watt—Package of 5	2.00
6192	Spring—3 gang tuning capacitor drive cord tension spring—Package of 10	.50
6250	Resistor—4,000 ohms—Carbon type—½ watt—Package of 5	2.00
6277	Capacitor — 0.1 mfd. capacitor — Located on metal shield	.75
6282	Resistor—60,000 ohms—Carbon type—½ watt—Package of 5	2.50

REPLACEMENT PARTS (Continued)

Stock No.	DESCRIPTION	List Price
3384	Capacitor—630 mmfd. oscillator series capacitor—Package of 5	$2.50
6288	Knob—Station selector—Volume control or tone control knob—Package of 5	1.50
6298	Cord—3 gang tuning capacitor drive cord—Package of 5	1.00
6302	Bracket—Dial lamp bracket and indicator—Package of 2	.50
6303	Resistor—20,000 ohms—Carbon type—½ watt—Package of 5	2.50
6308	Coil—R. F. coil complete with mounting bracket	1.90
6315	Resistor—45,000 ohms—Carbon type—½ watt—Package of 5	2.50
6317	Capacitor—0.05 mfd.—Capacitor	.70
6322	Volume control—Complete with mounting nut	1.65
6323	Shaft—Tuning condenser drive shaft with one flat washer and two "C" washers—Package of 2	.85
6324	Tone control—Complete with mounting nut—For R-74 only	1.90
7054	Cord—Power cord	1.00
7062	Capacitor—Adjustable tuning capacitor—15 to 70 mmfd	1.00
7439	Drum—Dial drum with set screws and 3 dial mounting nuts	.50
7440	Scale—Dial and dial scale	.75
7484	Socket—UY type Radiotron socket—6 used	.65
7485	Socket—6 contact socket—4 used	.70
7487	Shield—Radiotron tube shield—6 used—Plain finish	.50
7488	Shield—Tube shield top—1 used—Plain finish	.50
7501	Capacitor—3 gang variable tuning capacitor complete with mounting screws and washers	5.20
7504	Coil—Detector and oscillator coil complete with mounting bracket	3.50
7510	Shield—Radiotron tube shield—6 used—Maroon finish	.50
7511	Shield—Radiotron shield top—1 used—Maroon finish	.50
7512	Reactor—Detector plate reactor	2.00
7513	Capacitor pack—Comprising five 0.1 mfd., three 0.5 mfd., one 7. mfd., four 10. mfd., one 0.3 mfd., and one 1. mfd. capacitor in metal container	11.00
7514	Transformer—1st intermediate frequency transformer	3.00
7515	Transformer—2nd intermediate frequency transformer	3.00
7516	Board—Resistor board—Less resistors and capacitors	1.20
7517	Shield—Metal shield—Located under power transformer and Radiotron RCA-82	.55
7518	Reactor—Filter reactor	3.00
7519	Transformer—Audio input transformer	3.25
7521	Reactor—Tone compensating reactor—For R-76 and R-77	1.70
7522	Tone control—Complete with mounting nut—For R-76 and R-77	1.90
8932	Transformer—Power transformer 105–125 volts—50–60 cycles	8.25
8933	Transformer—Power transformer—105–125 volts—25–50 cycles	10.00
8934	Transformer—Power transformer—200–250 volts—50–60 cycles	9.00

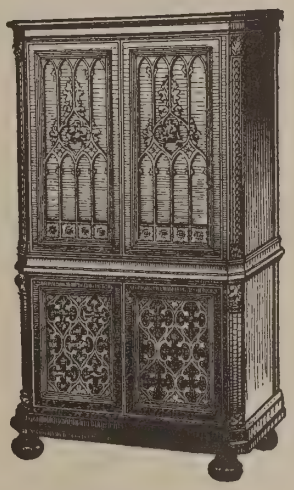
Stock No.	DESCRIPTION	List Price
	REPRODUCER ASSEMBLIES	
3005	Screw assembly—Comprising 4 screws, 8 nuts, 4 washers, and 4 eyelets—Package of 1 set—For R-74	$0.50
3237	Screw Assembly—Comprising 4 screws, 8 nuts, 4 washers, and 4 eyelets—Package of 1 set—For R-76 and R-77	.50
6184	Board—Terminal board with 3 terminals	.50
6325	Transformer—Output transformer	2.20
8920	Ring—Cone retaining ring	.50
8935	Cone — Reproducer cone complete — Package of 5	12.50
9420	Coil assembly—Comprising field coil, cone bracket and magnet	5.50
	CABINET ASSEMBLIES—R-74	
	(Prices furnished upon request)	
X120	Cabinet — Cabinet complete — Less equipment	
X121	Baffle—Board and grille cloth	
6113	Foot—Cabinet felt foot—Package of 15	
7441	Escutcheon—Station selector escutcheon	
	CABINET ASSEMBLIES—R-76	
	(Prices furnished upon request)	
X122	Cabinet—Cabinet complete less equipment	
X123	Moulding—Post moulding	
X124	Panel—Control panel	
X125	Overlay—Control panel top overlay	
X126	Moulding—Control panel side moulding—Package of 2	
X127	Moulding — Control panel bottom moulding	
X128	Cap—Control panel overlay cap—Package of 4	
X129	Top—Cabinet top	
X138	Stretcher assembly—Comprising front, side, and rear rails	
X139	Leg—Cabinet leg	
X140	Foot—Cabinet foot	
X141	Baffle—Board and grille cloth	
7441	Escutcheon—Station selector escutcheon	
	CABINET ASSEMBLIES—R-77	
	(Prices furnished upon request)	
2776	Catch—Door catch and strike with nail—Package of 2 sets	
6294	Hinge—Door hinges—1 set of 4 hinges with mounting screws	
X130	Knob—Door knob with mounting screw	
X131	Doors—Left and right hand door—1 pair	
X132	Top—Cabinet top	
X133	Overlay—Door overlay—Top	
X134	Overlay — Door overlay — Center — Package of 2	
X135	Baffle—Board and grille cloth	
X136	Panel—Control panel	
X137	Cap—Cap ornament for post—One set of 2	
X142	Overlay—Door Overlay—Bottom	
X143	Foot—Cabinet Foot	
X144	Leg—Cabinet Leg	
X145	Stretcher Assembly — Comprising End, Front and Back Rails	
7441	Escutcheon—Station Selector escutcheon	

S. O. 9330 10M—6-28-'32

RCA Victor

Radiola Automatic Electrola RAE-79

SERVICE NOTES



RCA Victor RAE-79

[First Edition—5M]
[Copyright, December, 1931]

SERVICE DIVISION

RCA Victor Company, Inc.

Camden, N.J.

A RADIO CORPORATION OF AMERICA SUBSIDIARY

REPRESENTATIVES IN PRINCIPAL CITIES

CONTENTS

PART I—REMOTE CONTROL UNIT

Page

Electrical Description 3
Increasing Length of Cable 5
Increasing Number of Boxes 5
Motor Contactor Adjustment Chart 6
Adjustment of Motor Contactors 7
Replacing or Adjusting Contactors 8
Making Replacements 8

PART II—SELECTOR SWITCH AND MISCELLANEOUS INFORMATION

Bendix Loudspeaker Switch 8
Radio Recordings 9
Microphone 9

PART III—WIRING DIAGRAMS

RAE-79 Wiring Diagrams 10

PART IV—REPLACEMENT PARTS

RAE-79 Replacement Parts 15

ILLUSTRATIONS

Page

Remote Control Motor Views 4
Schematic Diagram of Motor Circuits 5
End View of Drum and Contactor 5
Method of Adding Additional Cable 7
Connections for Adding Additional Boxes 7
Details of Tools 8
Friction Adjustment 8
Details of Microphone Adjustment 9
Schematic Diagram 10
Assembly Wiring 11
Receiver Wiring 12
S. P. U. No. 1 Wiring 13
S. P. U. No. 2 Wiring 14

SERVICE NOTES

for

RCA Victor Radiola Automatic Electrola, RAE-79

The RCA Victor Model RAE-79 is a thirteen tube, super-heterodyne radio receiver incorporated in the same cabinet with the perfected RCA Victor automatic record changing mechanism.

Features of this instrument are:

RCA Victor DeLuxe Radio Chassis incorporating Super Control Radiotrons, automatic volume control giving a new degree of quiet operation, remote control of tuning and volume, double push-pull amplifiers employing Pentode Output Radiotrons, and twin loudspeakers. The automatic record changing mechanism has provision for playing continuously, one side of ten 10-inch records of either the "standard" or Program Transcription variety and either type twelve inch records manually. Home recording on the RAE-79 reaches a new degree of perfection through the use of a studio type two button microphone and Pentode Output Radiotrons. Such records may be made either 78 or 33⅓ R.P.M. thus giving a maximum of eight minutes of home recording on a ten inch record.

SERVICE DATA

A reference to the R-50 and R-55 Service Notes covers the general service data on this type of instrument. The service data on the automatic record changing mechanism is contained in a booklet already issued. The service data on the remote control unit, while similar to that used in the Radiolas 82 and 86, is contained in this booklet, see Part I, page 3. Part II gives miscellaneous information on various parts, Part III shows the diagrams and Part IV is the replacement parts list.

PART I

SERVICE DATA ON REMOTE CONTROL UNIT

The Remote Control Contactors of Model RAE-79 are adjusted at the Factory with a 115 volt A. C. input being applied to the receiver. Due to the extreme selectivity of the receiver used, it may be necessary to readjust the motor contactors when the instrument is used on extremely high or low line voltages. The following test covers these adjustments thoroughly.

This is also true on Models used at frequencies other than that specified. For example, when a 60 cycle model is used on 50 cycles, the phonograph motor must be changed and the remote control contactors completely readjusted.

The remote control feature is unique in that it not only allows control of the receiver from a distant point but also pre-selects the desired station accurately. Manual tuning, other than necessary for the original setting of the selector buttons, is therefore eliminated. Selection of any one of four stations, adjustment of the volume control, turning the receiver "on" or "off" or changing from Radio to Record may be accomplished at one or more remote points from the receiver. Operation of the tone control or home recording must be done at the receiver.

One control box and twenty-five feet of flat cable are supplied. If desired, any number of additional units may be installed or the cable lengthened to seventy-five feet.

Electrical Description of Unit

The remote control feature consists of a standard R-50 chassis with a special gang condenser; a capacitor motor coupled to the gang condenser through a series of gears; a series of drums and contactors by which the motor is started in the right direction for a given station and stopped at the right point; a special volume control geared to the motor; a relay to turn the set "on" or "off" and a remote control box by which these operations are controlled.

The motor is provided with a tapped reactor and condenser for changing the phase angle of the applied current so that operation in either direction may be secured. The motor operates at 23 volts for the station selector and 18 volts for the volume control.

Referring to Figure 1 we see the normal position of the motor armature. It will be noted that a spring holds the armature so that the gear at one end is meshed with the volume control gears. At 18 volts, the voltage used for volume control operation, the gears remain in this position and operation of the volume control is secured. When the speed of the motor is increased by operating it at 23 volts, this voltage being used when the selector buttons are pressed, the end thrust of the armature causes it to move laterally, thereby disengaging the gear at the volume control end and engaging the gear at the station selector end. See Figure 2. The spring at the end of the armature causes it to always return to the volume control position when the current is "off" at the motor. As this action takes place with the motor operating in either direction, controlling the voltage at which the motor is operated determines its function. A sixty ohm resistor is placed in each motor circuit controlling the volume to reduce the voltage from 23 to 18 volts.

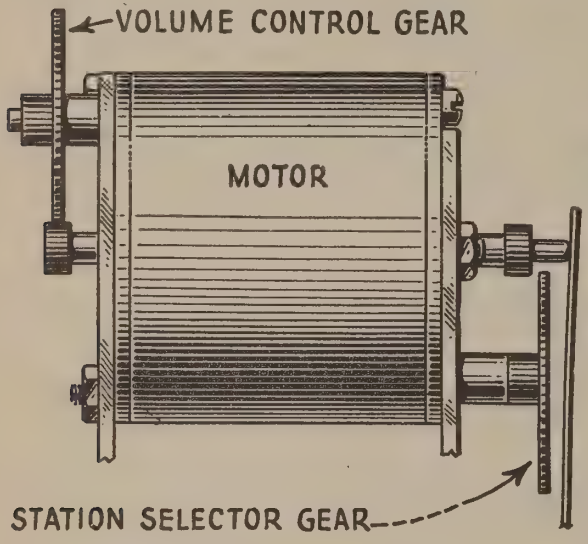


Figure 1—Motor with armature in volume control position

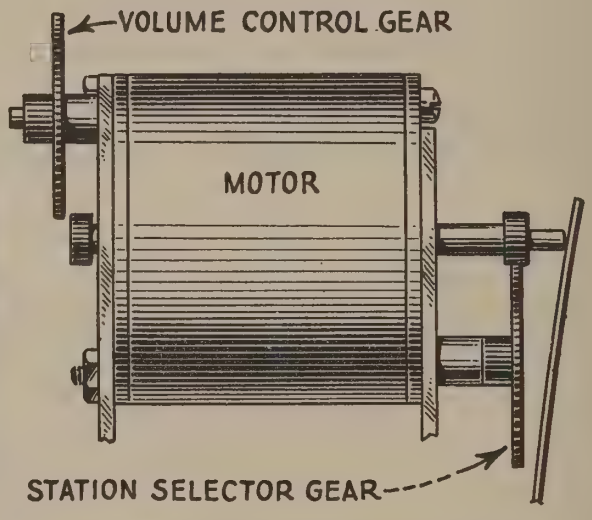


Figure 2—Motor with armature in station selector position

The proper direction of operation and stopping of the motor for selection of a desired station is controlled by a series of drums and contactors. Figure 3 shows a schematic circuit of the motor and its adjacent circuits. The drums hold the contactors in the proper position so that when a particular selector button is depressed, the motor will turn in the right direction. When the contactor is at the point on the drum where it is half way between each contact, the motor stops. This is 180° from the hole that is used to set the drum for a particular station.

The setting of the drums is made by the pins on the front panel. These are known as the "setting buttons." The selector button is pressed and the drum is moved by the motor until the corresponding contactor is midway between the contacts. The pin will now fall in the hole in the drum if pushed in by the finger. See Figure 4. Holding the pin firmly in the hole, the desired station is then accurately tuned in by means of the manual station selector knob. After tuning the pin is then released. As the point on the opposite side of the drum is where the diameter of the drum changes, the contactor is half way between the contacts. Pressing the selector buttons will therefore cause no movement of the motor. If another button is pressed and the drum moved, pressing the original button will always bring the drum back to the position for which it was set.

Referring to Figure 10, the schematic diagram, it will be noted that a common lead is used for the pilot lamp and the selector buttons in the remote control box. By doing this, when a selector button on the box is pressed, the current through the common lead is increased, likewise the voltage drop in the lead is increased. The result is that while the motor is running the pilot lamp becomes very dim. As soon as the motor stops, the lamp flashes bright, thus indicating that the motor has stopped and the station is tuned in. If the station is not then heard, it is necessary to press the + volume control button a little at a time until the desired output level is obtained.

Special Installations

(1) INCREASING LENGTH OF REMOTE CONTROL BOX CABLE

The cable to the remote control box supplied with the remote control models is twenty-five (25) feet in length. This is ample for most rooms as it is very rare that a person wishes to listen to a program at a greater distance from the loudspeaker.

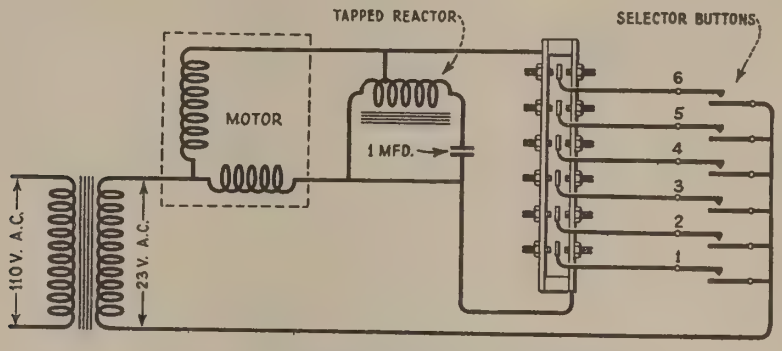


Figure 3—Schematic diagram of motor circuits

If, however, it is desired to place the remote control box at a greater distance from the set, any twelve conductor cable, the wires of which are No. 14 or larger in size, may be used to splice onto the regular cable and increase the total length up to seventy-five (75) feet. Figure 5 shows the method recommended for adding this additional cable.

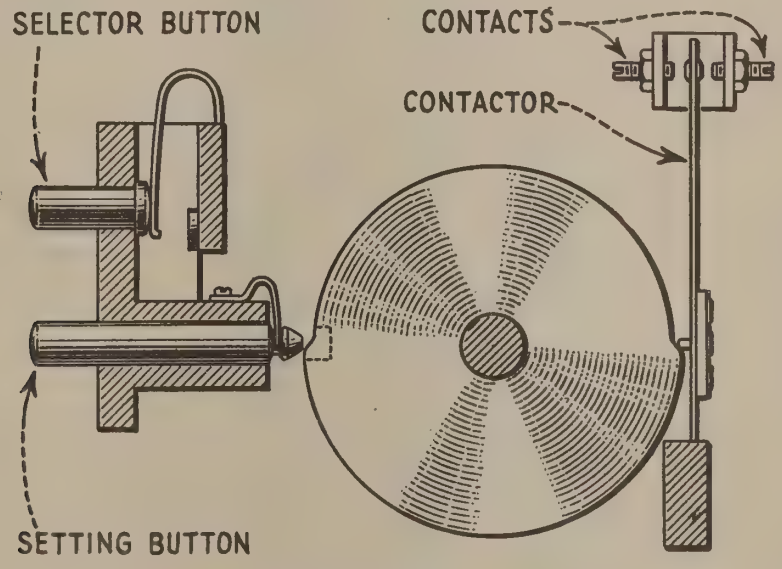


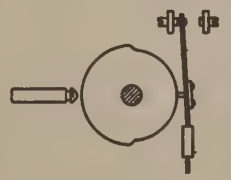
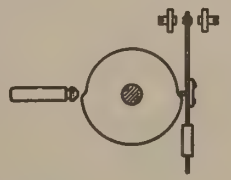
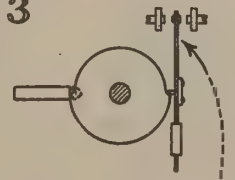
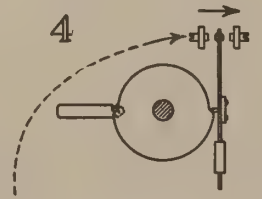
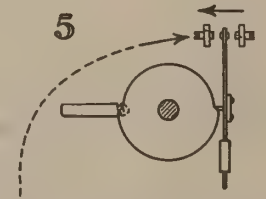
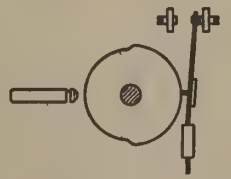
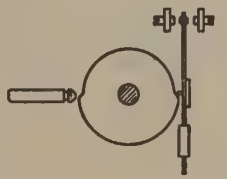
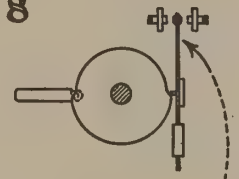
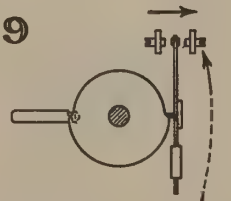
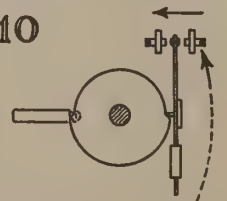
Figure 4—End view of drum and contactor

(2) INCREASING NUMBER OF REMOTE CONTROL BOXES

One remote control box is supplied as standard equipment. Any number of additional boxes may be installed if desired although only one box can be used at a time for controlling the receiver. The boxes should be connected in parallel at the terminal strip on the rear of the Radiola. Figure 11 shows such a connection.

MOTOR CONTACTOR ADJUSTMENT CHART

Repeat Entire Procedure on Station Selector Contactors

TURN STATION SELECTOR KNOB UNTIL CONTACTOR IS TO ONE SIDE  1	PUSH SELECTOR BUTTON ON PANEL UNTIL THE MOTOR STOPS AND CONTACTOR IS CENTERED  2	THEN PUSH SETTING BUTTON. IF CONTACTOR DOES NOT MOVE, ADJUSTMENT IS O.K.  3 *DOES NOT MOVE WHEN SETTING BUTTON IS PRESSED*	IF CONTACTOR MOVES IN THIS DIRECTION WHEN SETTING BUTTON IS PRESSED, ADJUST AS INDICATED.  4 *TURN THIS SCREW CLOCKWISE A LITTLE AT A TIME UNTIL CONTACTOR DOES NOT MOVE WHEN SETTING BUTTON IS PRESSED. (TURN SELECTOR KNOB AND RETUNE WITH SELECTOR BUTTON AFTER EACH TRIAL ADJUSTMENT)*	IF CONTACTOR MOVES IN OTHER DIRECTION, ADJUST AS INDICATED.  5 *TURN THIS SCREW COUNTER CLOCKWISE A LITTLE AT A TIME UNTIL CONTACTOR DOES NOT MOVE WHEN SETTING BUTTON IS PRESSED. (TURN SELECTOR KNOB AND RETUNE WITH SELECTOR BUTTON AFTER EACH TRIAL ADJUSTMENT)*
AFTER MAKING PRECEDING ADJUSTMENTS TURN STATION SELECTOR KNOB UNTIL CONTACTOR IS TO THIS SIDE  6	PUSH SELECTOR BUTTON ON PANEL UNTIL THE MOTOR STOPS AND CONTACTOR IS CENTERED  7	THEN PUSH SETTING BUTTON. IF CONTACTOR DOES NOT MOVE, ADJUSTMENT IS O.K.  8 *DOES NOT MOVE WHEN SETTING BUTTON IS PRESSED.*	IF CONTACTOR MOVES IN THIS DIRECTION WHEN SETTING BUTTON IS PRESSED, ADJUST AS INDICATED.  9 *TURN THIS SCREW COUNTER CLOCKWISE A LITTLE AT A TIME UNTIL CONTACTOR DOES NOT MOVE WHEN SETTING BUTTON IS PRESSED. (TURN SELECTOR KNOB AND RETUNE WITH SELECTOR BUTTON AFTER EACH TRIAL ADJUSTMENT)*	IF CONTACTOR MOVES IN THIS DIRECTION, ADJUST AS INDICATED. THEN REPEAT ALL ADJUSTMENTS ON ALL SIX CONTACTORS.  10 *TURN THIS SCREW CLOCKWISE A LITTLE AT A TIME UNTIL CONTACTOR DOES NOT MOVE WHEN SETTING BUTTON IS PRESSED. (TURN SELECTOR KNOB AND RETUNE WITH SELECTOR BUTTON AFTER EACH TRIAL ADJUSTMENT)*

Adjustments

(1) ADJUSTMENT OF MOTOR CONTACTORS

The four station selector motor contactors located at the rear of the motor may require adjustment due to changes in the amount of friction in the entire drive assembly. Need for adjustment is evidenced by the motor failing to stop at the exact point for a particular station.

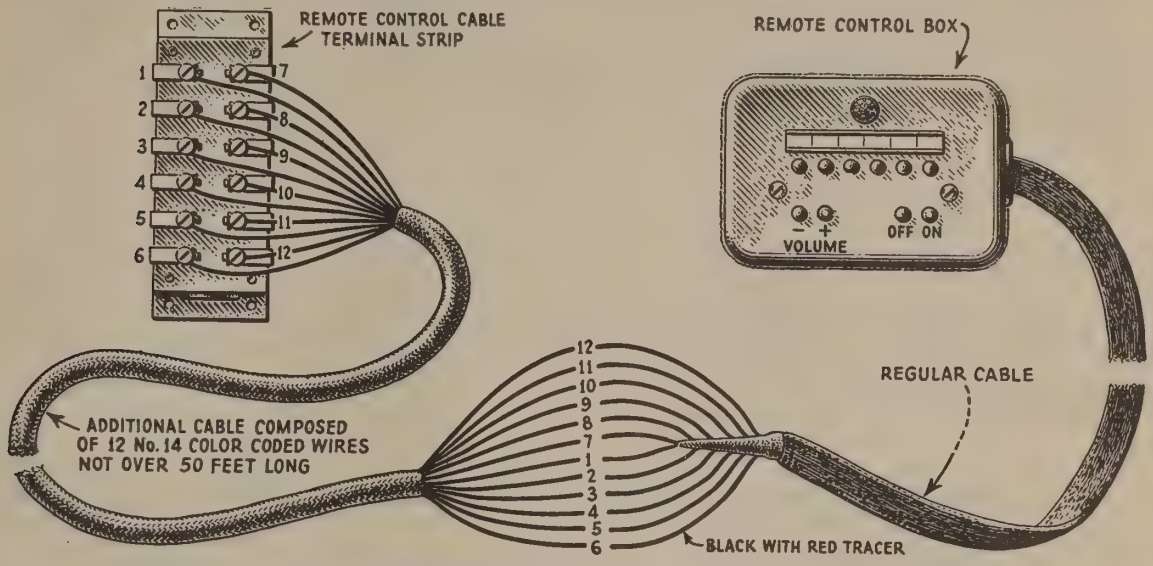


Figure 5—Wiring diagram of method for connecting additional cable

In order to make these adjustments two tools are necessary. They may be constructed, see Figure 7, or obtained as a spare part, the replacement parts section listing them. The chart on page 6 gives the procedure to be followed for making adjustments. This procedure must be repeated on each contactor that is out of adjustment.

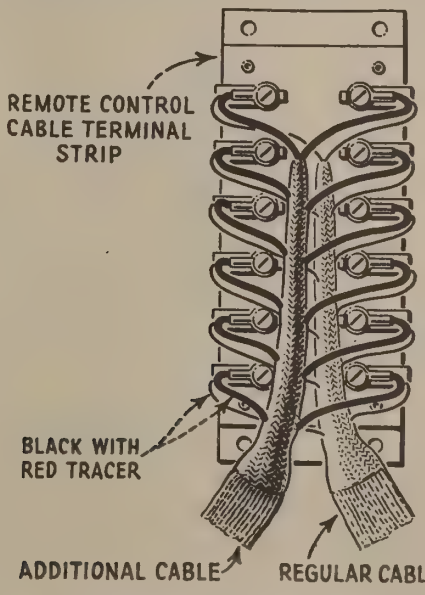


Figure 6—Connections for adding additional boxes

If all contactors are out of adjustment in a similar manner, then the friction screw, see Figure 8, requires adjustment. This should be either tightened or loosened, the exact adjustment to be determined by trial. The adjustment that is correct for one contactor will be correct for all, assuming the friction screw to be at fault.

(2) REPLACING OR ADJUSTING CONTACTORS

Six contactors are used for connecting the motor so that it rotates in the proper direction. To make this adjustment or replacement, a special offset screw driver will be required unless the unit is to be removed from the base. This is shown in Figure 12 and is also listed in the replacement parts, see page 15.

Referring to Figure 4 we see that when the setting button is in the hole in the drum, the contactor for that particular drum is exactly half way between the contacts. The holes that hold the contactors are elongated so that they may be raised or lowered until they rest exactly half way between the contacts when the setting button is inserted in the drum hole. This is the only adjustment required of these contactors, and with the special screw driver is quite easy to make.

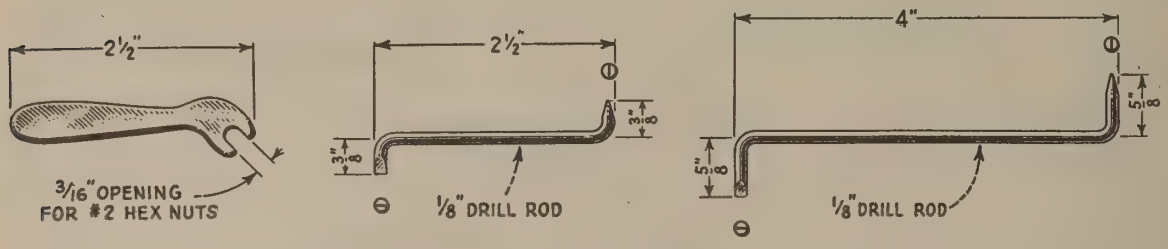


Figure 7—Constructional details of special tools used with remote control models

(3) MAKING REPLACEMENTS

The operating relay, the resistors, the motor, the gears and other small parts may be replaced. All power transformers when replaced must have the primaries so connected that the pilot light on the remote control box lights properly. If the transformers are improperly phased, the lamp

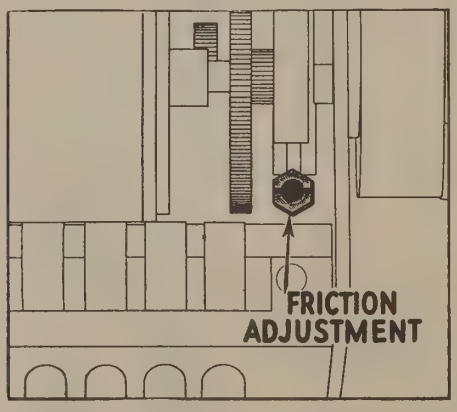


Figure 8—Location of Friction Adjustment

will brighten instead of dim when a selector button is pressed. The drum assembly is specially fitted and assembled and any individual replacements can not be made. If trouble is experienced in this assembly, a complete replacement of the unit will be required. The parts replaceable are listed in the replacement parts, page 15.

PART II—SELECTOR SWITCH AND MISCELLANEOUS INFORMATION

(1) BENDIX LOUDSPEAKER SWITCH

At the end of the selector switch motor a switch is located that shorts the cone coil when the instrument is changing from one function to another.

The switch is operated by the lateral thrust of the motor wherever it goes into operation. If for any reason, noise should be heard when changing from Radio to Record or Home Recording, it may be due to this switch not functioning. Bending the lever so that it makes proper contact will remedy this condition.

(2) PRECAUTIONS WHEN MAKING RADIO RECORDING RECORDS

When making radio recording records, it is necessary that the radio volume be adjusted for its greatest undistorted output if good quality records are to be obtained. While using the maximum undistorted output it is also important that the volume control should not be advanced beyond this point, as it is possible that the maximum *distorted* output, if fed into the pickup long enough, will cause the pickup coil to heat and its wax to run out.

(3) SERVICE DATA ON MICROPHONE

The Microphone used on Model RAE-79 is a two-button studio type that has excellent frequency characteristics and is simple and rugged in construction. Generally, any failure in the microphone can be remedied only by replacing the unit. However, an unbalance in the buttons may be corrected by means of a small adjustment. The following procedure details the correct manner in making this adjustment. Refer to Figure 9.

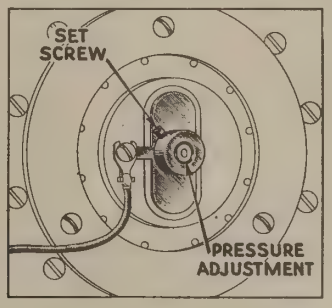


Figure 9—Details of Microphone Adjustment

(a) Remove the microphone from its shell. Be careful not to lose its supporting springs. Measure the D. C. resistance of each button. This may vary from 200 to 1000 ohms, but each button should be measured within 50% of the other.

(b) Loosen the set screw shown in Figure 9, and adjust the pressure of the cup by either increasing or decreasing its pressure against the diaphragm. Increasing the pressure reduces the resistance and decreasing it, increases the resistance of the button. Usually it is best practice to match the buttons by increasing the resistance rather than by decreasing it. Be very careful however to avoid spilling any carbon granules.

PART III—WIRING DIAGRAM

The following pages show the various schematic and wiring diagrams of the RAE-79. Reference to these illustrations is necessary when doing various service work, especially replacing parts.

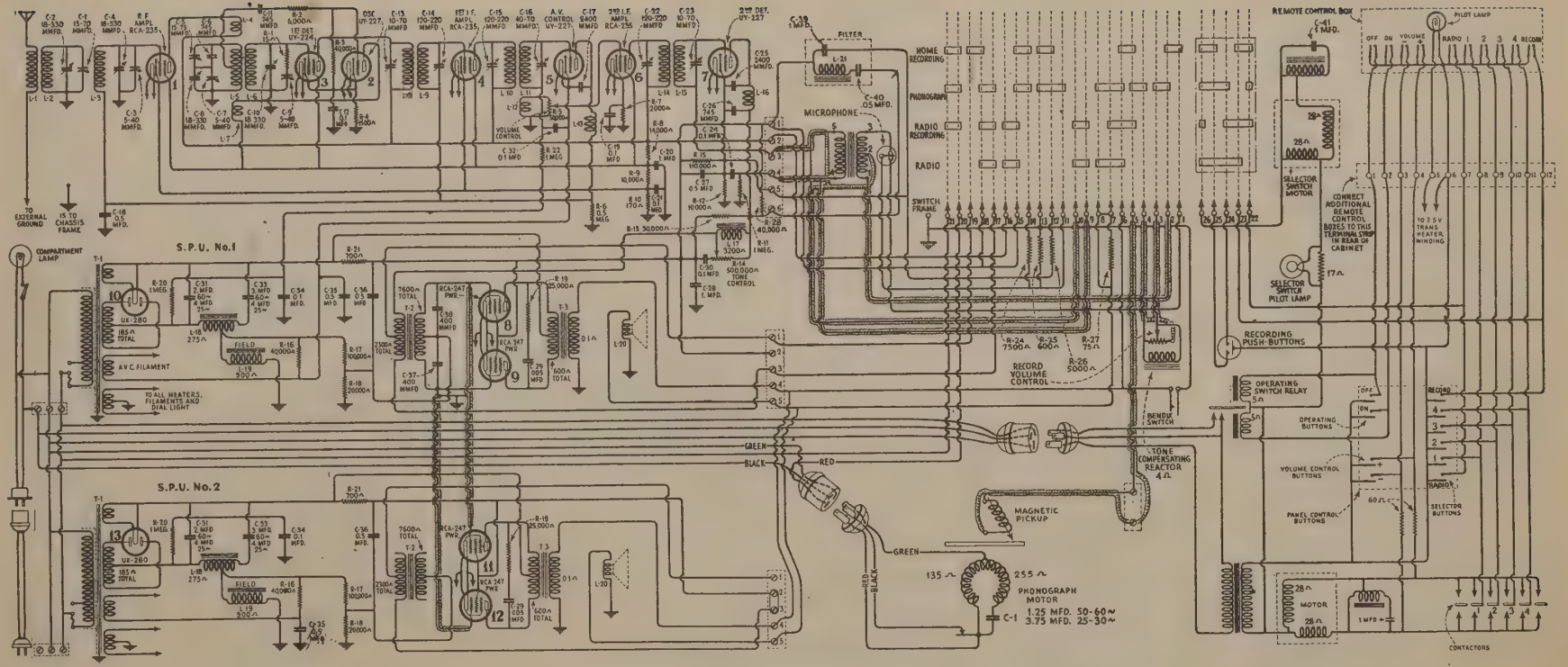


Figure 10—Schematic diagram of Model RAE-79

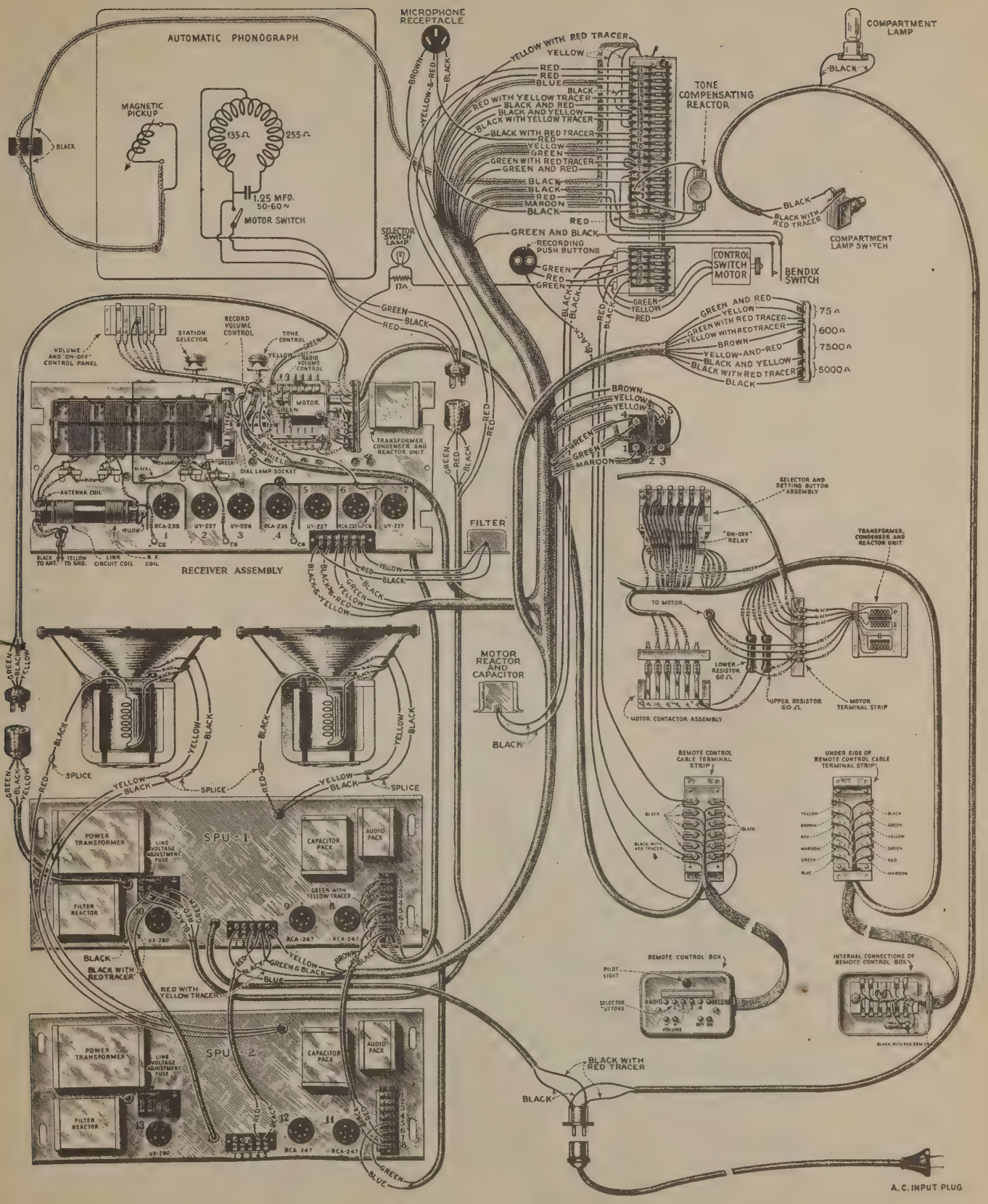


Figure 11—Assembly Wiring diagram

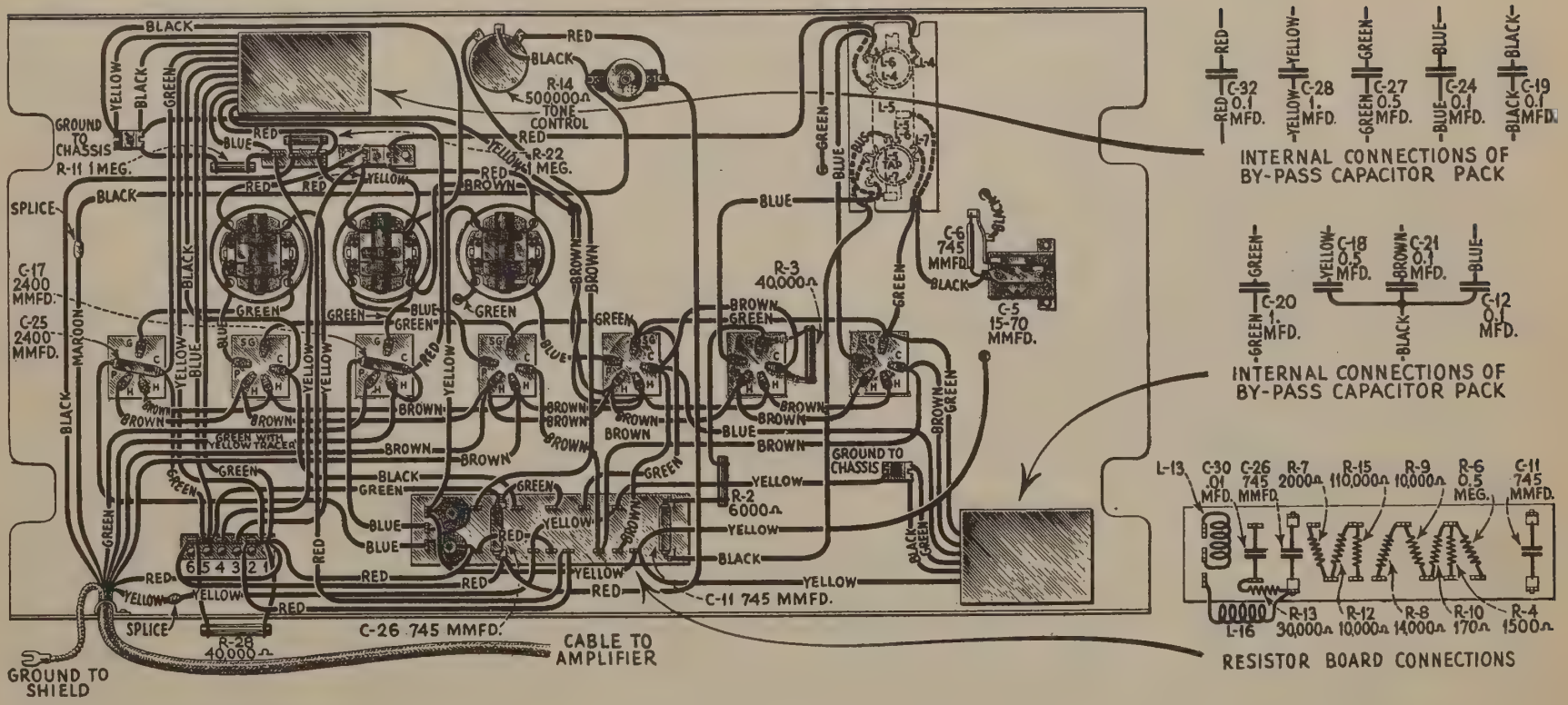


Figure 12—Receiver Assembly Wiring

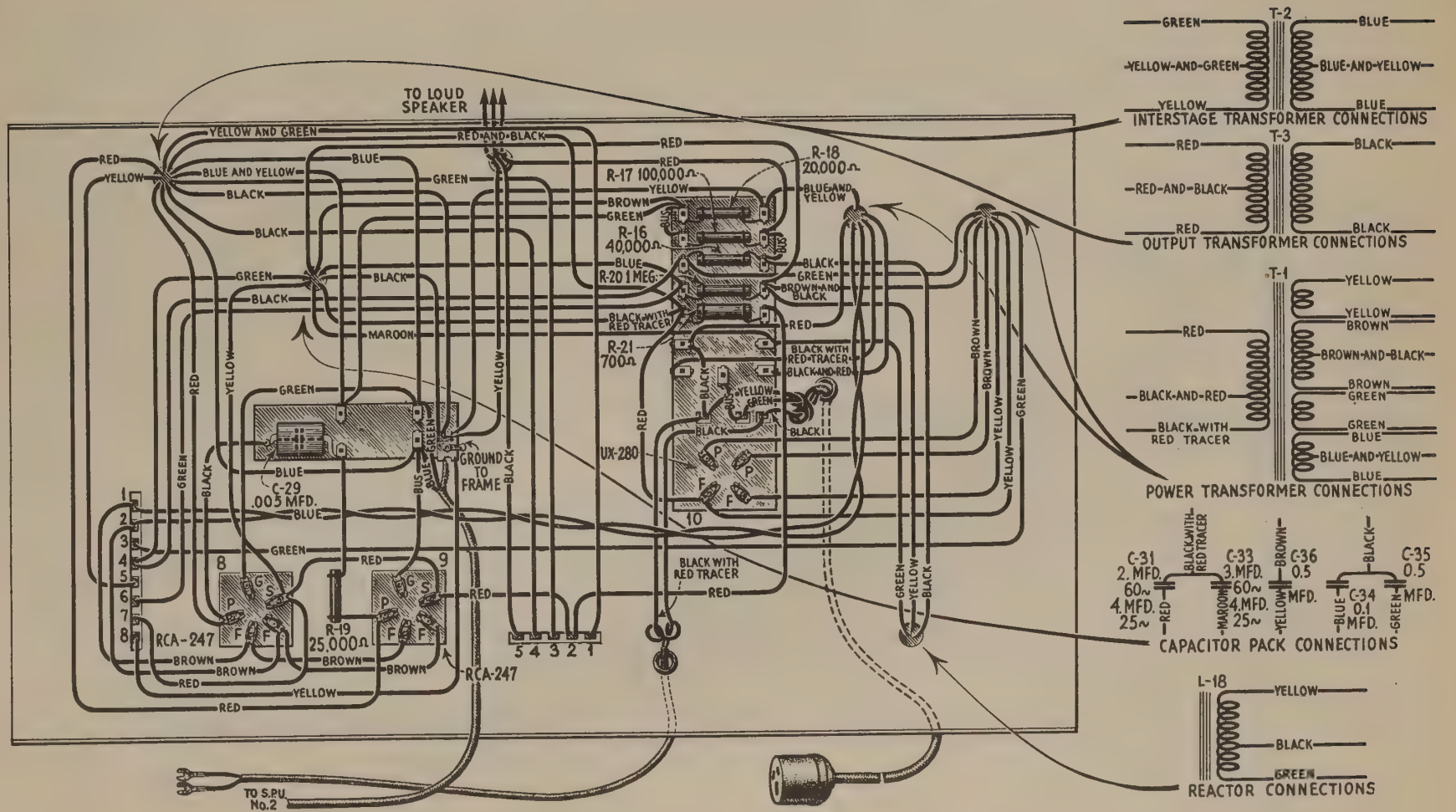


Figure 13—S. P. U. No. 1 wiring

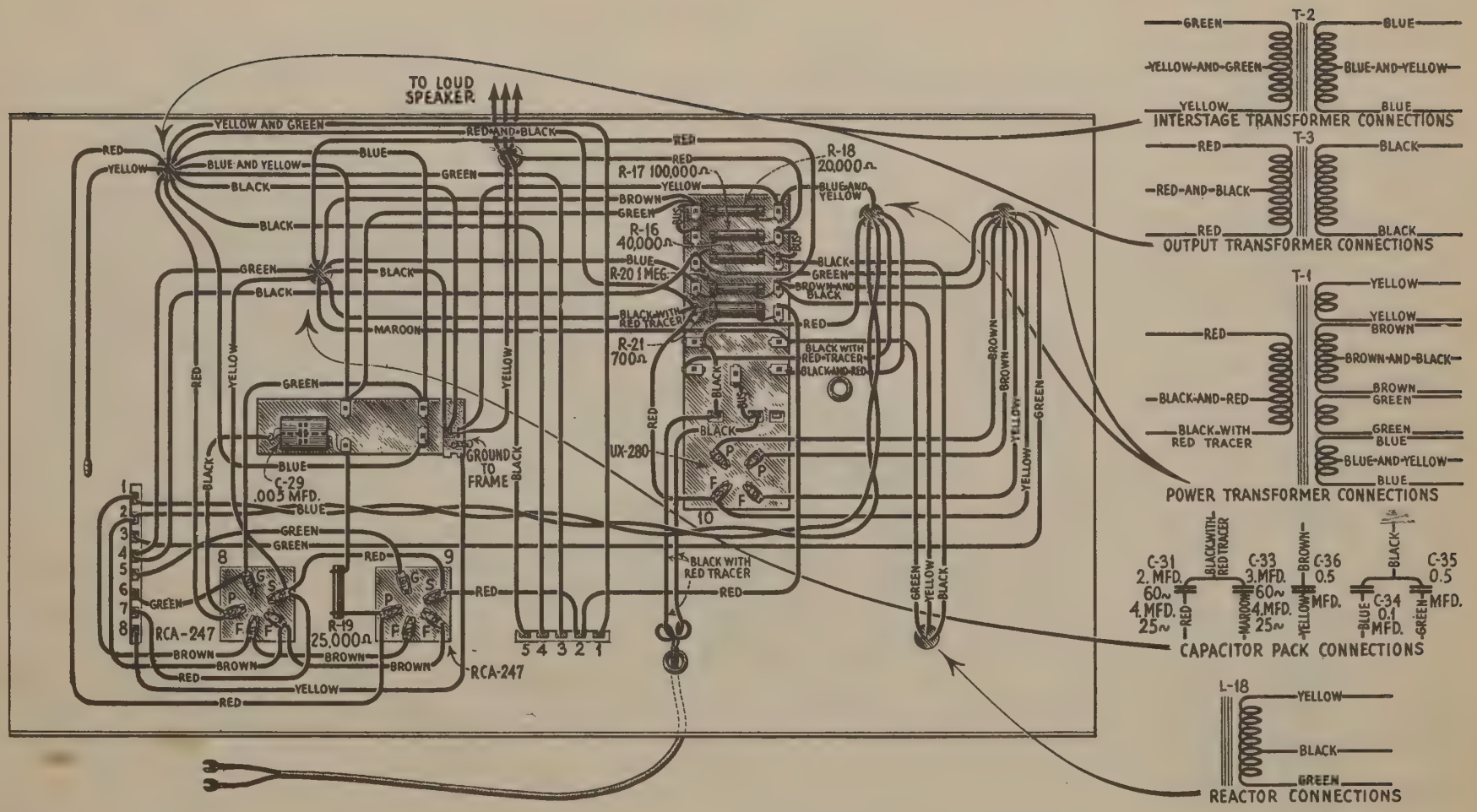


Figure 14—S. P. U. No. 2 wiring

PART IV—REPLACEMENT PARTS

Stock No.	DESCRIPTION	List Price
	RECEIVER ASSEMBLY	
2563	Resistor—6,000 ohms—Carbon type—Package of 5	$3.00
2726	Socket—UY Radiotron socket with socket cover—7 used	.70
2731	Resistor—10,000 ohms—Carbon type—Package of 5	2.00
2732	Resistor—110,000 ohms—Carbon type—Package of 5	2.00
2736	Resistor—170 ohms—Carbon type—Package of 5	2.00
2740	Cord—Condenser drive cord—Package of 5	1.00
2741	Idler—Package of 5	.80
2746	Socket—Tuning dial lamp socket	.50
2747	Caps—Grid Contactor caps—Package of 5	.50
2749	Capacitor—2400 mmfd.	1.50
2970	Resistor—500,000 ohms—Carbon type—Package of 5	2.50
3031	Board—Terminal board with insulator—3 Terminals	.50
3033	Resistor—1 megohm—¼ watt—Carbon type—Package of 5	2.00
3045	Resistor—40,000 ohms—1 watt—Carbon type—Package of 5	2.50
3050	Resistor—14,000 ohms—Carbon type	.60
3137	Knob—Station selector, volume control and control-switch knob—Package of 5	3.25
3138	Board—Terminal board with one double soldering terminal bracket and insulator	.50
3139	Coil—1st Detector and oscillator coil and shield	3.95
3142	Volume control—Radio volume control	1.65
3143	Tone Control—Complete with mounting nut	1.50
3144	Inductor—Tone control inductor	1.65
3152	Resistor—30.000 ohms—Carbon type—Package of 5	2.75
3153	Resistor—1,500 ohms—Carbon type—Package of 5	2.75
3154	Resistor—2,000 ohms—Carbon type—Package of 5	2.75
3220	Resistor—15 ohms—Flexible wire type—Package of 5	2.75
3240	Nut—Shield cover mounting nut—Package of 13	.50
3263	Screw—Special 4-40 machine screw for rotor plate—adjustment—Package of 10	.50
6034	Cushions — Sponge rubber chassis cushions—Package of 4	1.20
7062	Capacitor—Adjustable capacitor—15-70 mmfd.—2 used	1.00
7063	Capacitor—Adjustable capacitor—5—40 mmfd.—3 used	1.00
7278	Coil—R.F. and link circuit Coil	2.50
7280	Board — Terminal board with six terminals	.90
7281	Transformer—1st Intermediate transformer	3.25
7282	Transformer—2nd Intermediate transformer—25-40 cycles	$3.50
7283	Transformer—3rd Intermediate transformer	3.25
7284	Board—Resistor board complete less resistors, capacitors and coils	2.70
7285	Capacitor—Comprising one 1.0 mfd., one 0.5 mfd. and two 0.1 mfd. capacitors in metal container—6 leads	3.50
7286	Capacitor—Comprising one 1.0 mfd., one 0.5 mfd. and three 0.1 mfd. capacitors in metal container—10 leads	4.50
7287	Bracket — Dial lamp bracket and indicator	.50
7288	Scale—Tuning dial scale—Package of 5	2.50
7297	Coil—R.F. choke coil	.75
7298	Capacitor—0.01 mfd.	.80
7299	Capacitor—745 mmfd.	.70
7331	Cable—Receiver chassis shielded wiring cable—from receiver to S.P.U.	2.30
7365	Transformer—2nd Intermediate transformer	3.55
7366	Drum—Dial drum with star gear	1.65
7367	Drum—Dial drum—25-30 cycle	1.10
7368	Drive Shaft Assembly—Comprising drive shaft, idler shaft, cord drive pins, washer and bracket	.90
8708	Capacitor — Tuning Capacitor Assembly—Comprising four adjustable capacitors, drive shaft, dial drum drive cord and spring—Assembled—25-30 cycle	12.25
8779	Capacitor — Tuning Capacitor Assembly—Comprising four adjustable capacitors, drive shaft, dial drum drive cord, spring and star gear—Assembled	12.25
8790	Shield—Complete receiver shield	7.25
8791	Cover—Removable shield cover	1.50
8794	Shield—Complete receiver shield—25-30 cycle	7.25
10867	Spring—Drive cord tension spring—Package of 5	.50
	AMPLIFIER No. 1	
2546	Resistor—1 megohm—Carbon type—Package of 5	3.00
3045	Resistor—40,000 ohms—1 watt—Carbon type—Package of 5	2.50
3058	Resistor—100,000 ohms—Carbon type—Package of 5	2.50
3085	Capacitor—400 mmfd.	.60
3099	Capacitor—0.005 mfd.	.75
3145	Resistor—700 ohms—Carbon type	.85
3146	Board—Capacitor terminal board complete with terminal less capacitor	1.25
3149	Switch—Toggle type power switch	1.25
3264	Resistor—25,000 ohms—½ watt—Carbon type—Package of 5	2.00
6114	Resistor—20,000 ohms—Carbon type—Package of 5	2.00
7290	Reactor—Filter reactor	4.75

Order By Stock Number Only

REPLACEMENT PARTS—Continued

Stock No.	DESCRIPTION	List Price
7291	Board — Terminal board and UX Radiotron socket complete with terminals and fuse clips	$0.50
7293	Board—Terminal board complete with 8 terminals and screws	1.15
7294	Cover—Cover with insulation for No. 7293	.60
7295	Board—Terminal board complete with 5 terminals, screws and link	.85
7369	Socket—UY Radiotron socket with insulation strip—2 used	.70
7370	Cover—Cover with insulation for No. 7295	.55
7371	Cover—Fuse cover with insulator	.50
7372	Cable—26″ Black and black with red tracer cable—From resistor board of SPU No. 1 to terminal board of SPU No. 2	.55
8711	Transformer—Audio transformer	6.60
8749	Transformer—Power transformer 105-125 volts, 25-60 cycles	20.50
8751	Capacitor Pack—Comprising two 4.0 mfd., one 0.1 mfd. and two 0.5 mfd. capacitors in metal container	9.50
8780	Cable—Power cable with 3 way female polarity plug—From S.P.U. to control switch and record changer—25-30 cycle	1.75
8781	Cable—26″ Blue and green shielded cable—From capacitor board of SPU No. 2 to terminal board of SPU No. 1	.80
10907	Fuse—3 amperes—Package of 5	.50
	AMPLIFIER No. 2	
	NOTE: Same as Amplifier No. 1 omitting stock No. 3085	
	REPRODUCER ASSEMBLIES	
7373	Reproducer mounting bolt assembly—Comprising 2 bolts, 4 washers and 2 nuts—Package of 1 set	.50
8558	Reproducer paper cone	4.00
8559	Cone retaining ring	.80
8713	Coil—Reproducer field coil	5.00
	MOTOR BOARD AND AUTOMATIC RECORD CHANGER ASSEMBLY	
2614	Switch—Motor Switch	1.40
2620	Cushions—Pickup rubber cushions—Comprising two pivots and one damper cushion—Package of 5 sets	1.25
2767	Spring—Pickup magnet spring—Package of 10	.50
2768	Armature—Pickup armature	.50
2769	Coil—Pickup coil	.50
2770	Plate—Pickup damper plate—Package of 5	.50
2771	Screw—Pickup damper plate mounting screw—Package of 10	.50
2779	Pointer — Recording control switch metal pointer—Package of 10	.50
2857	Plug—Three way male connector plug	.70
2893	Spring—Trip lever spring—Package of 10	.60
2896	Spring—Cable lever spring—Package of 10	$0.50
2897	Screw and nut—Pickup arm cable adjusting screw and nut—Package of 5	.50
2898	Screw and nut—Adjusting screw and lock nut for elevator shaft—Package of 10	.50
2902	Screw and nut—Motor turntable spindle screw and nut—Package of 10	.50
2903	Screw—Motor mounting screw—Package of 10	.50
2904	Lever—Front elevator actuating lever	.50
2905	Screw—Gear and bracket mounting screw—Package of 10	.50
2906	Spring—Check lever spring—Package of 10	.50
2907	Screw—Clutch set screw—Package of 10	.50
2908	Spring—Clutch pawl spring—Package of 10	.50
2909	Spring—Four finger spring—$^{13}/_{16}$″ long—Package of 10	.60
2910	Spring—Four finger spring—$1^{7}/_{16}$″ long—Package of 10	.60
2911	Screw—Slide bracket screw—Package of 10	.50
2912	Roller—Slide roller complete with screw stud—Package of 5	1.50
2913	Spring—Cable lever spring—Package of 10	.60
2914	Spring—Flat spring with screws—Package of 10	.50
2915	Spring—Locating lever spring—Package of 10	.50
2916	Plate—Latch plate with mounting screws—Package of 5	.50
2917	Washer—Spring washer—Package of 10	.50
2918	Spring—Index lever spring—Package of 10	.50
2919	Screw and Nut—Stop screw and nut—Package of 10	.50
2920	Washer — Friction washer — Package of 10	.50
2929	Lever—Rear elevator actuating lever—Package of 2	.50
3052	Screw Assembly—Pickup pole shoe mounting screw, nut and washer—Package of 10 sets	.50
3159	Friction brake—Gear reducing friction brake spring and pad with mounting rivets—Package of 4	2.00
3161	Spring—Shift lever spring—Package of 5	1.20
3167	Magnet—Pickup magnet	2.60
3169	Pole shoe—Pickup pole shoe—R.H.	1.45
3170	Pole shoe—Pickup pole shoe—L.H.	1.45
3173	Plug—Three prong female connector plug and microphone socket	1.30
3175	Receptacle — Needle receptacle for Tungstone boxes	.75
3184	Board—Pickup terminal board	.50

Order By Stock Number Only

REPLACEMENT PARTS—Continued

Stock No.	DESCRIPTION	List Price
3186	Control—Volume control and operating switch complete with mounting washer and nut—25-30 cycles	$2.20
3187	Weight—Recording weight	1.40
3189	Box—Needle box with lid—Package of 2	.70
3192	Post—Roller post assembly for supporting record magazine	.75
3193	Screw—Magazine bearing mounting screw and nut—Package of 10	.50
3194	Screw—Pickup arm base mounting screw and nut—Package of 10	.50
3195	Lever—Record transfer lever with screw and nut	1.65
3196	Screw—Record transfer lever mounting screw and nut—Package of 10	.50
3197	Escutcheon—Turntable speed escutcheon plate with mounting rivets—Package of 2	.70
3198	Bushing—Insulator rubber bushing—Package of 10	.50
3199	Screw—Bottom plate mounting screw—Package of 10	.50
3200	Shaft—Front or rear elevator shaft	.80
3201	Rear elevator pad—Package of 5	2.75
3202	Front elevator pad—Package of 5	3.00
3203	Screw—Elevator pad mounting screw—Package of 10	.50
3204	Cable—Pickup arm cable—Package of 5	1.50
3205	Screw—Pickup needle holder screw—Package of 10	.80
3206	Cover—Pickup cover	.75
3207	Screw—Pickup cover mounting screw—Package of 10	.50
3208	Screw Assembly—Pickup mounting screw, nut and washer—Package of 10	.60
3209	Lever—Trip lever	1.10
3210	Lever—Magazine lever	.65
3211	Washer—Turntable spindle leather washer—Package of 10	.50
3212	Spring — Turntable spindle plunger spring—Package of 10	.50
3213	Bolt—Motor board mounting bolt—Package of 8	.90
3214	Pulley—Cable pulley with mounting stud—Package of 5	.50
3217	Lever—Check lever	.50
3261	Cap—Rubber cap for turntable spindle—Package of 5	.50
3262	Screw and Nut—Record transfer lever adjusting screw and nut—Package of 10	.60
3280	Washer—Metal washer located under gear reducing unit—Package of 20	50
3282	Cup—Needle cup	.50
6115	Pawl—Clutch pawl	1.25
6116	Ratchet—Gear and ratchet complete with set screw	.90
6117	Screw and nut—Pickup arm height adjusting screw and lock nut—Package of 10	.50
7151	Back—Pickup back housing	.50
7186	Gear—Gear and bracket	1.40
7188	Bracket—Slide bracket with roller	$0.75
7189	Lever—Front and rear elevator cam lever—Package of 5	2.20
7190	Lever—Locating lever	.85
7191	Lever—Cable lever	.60
7192	Cam—Cam gear and cam	1.50
7194	Rotor and Shaft—60 cycles	8.00
7204	Rotor and shaft—50 cycles	8.00
7305	Gear reducing unit complete	4.50
7311	Resistor—20,675 ohms tapped porcelain resistor—25-30 cycles	2.00
7313	Switch—Selector switch with mounting nut and escutcheon	6.40
7315	Spindle and gear—Turntable spindle with gear—25 cycles	6.00
7316	Spindle and gear—Turntable spindle with gear—30 cycles	6.00
7317	Spindle and gear—Turntable spindle with gear—50 cycles	5.00
7318	Spindle and gear—Turntable spindle with gear—60 cycles	5.00
7319	Rotor and shaft—25 cycles	10.00
7320	Rotor and shaft—30 cycles	10.00
7321	Lever—Cable guide lever with pulley	.90
7322	Lever—Manual index lever	.60
7323	Magazine bearing—Located on motor board	1.35
7324	Pickup arm base bearing—Located on motor board	.85
7325	Pickup—Pickup unit complete	12.50
7330	Capacitor—Motor capacitor 3.75 mfd. for 25 or 30 cycles	4.00
7363	Pad—Rubber pad for front elevator—Package of 10	.50
7364	Lever—Speed reducing shift lever	.50
7374	Cover—Turntable covering	.50
7375	Resistor—13,175 ohms—Tapped porcelain resistor	2.10
8644	Capacitor—Motor capacitor—1.25 mfd. for 50 or 60 cycles	1.40
8646	Slide—Main slide	2.20
8647	Lever—Four finger lever	1.20
8752	Motor—Motor complete—25 cycles	41.00
8753	Motor—Motor complete—30 cycles	41.00
8754	Motor—Motor complete—50 cycles	41.00
8755	Motor—Motor complete—60 cycles	33.50
8757	Arm — Pickup arm complete with weight—less pickup unit	6.00
8758	Magazine—Record magazine	4.00
8782	Board—Motor board assembled with speed reducing lever, lever spring, elevator bushings and speed escutcheon plate	6.10
8783	Turntable—Turntable with cover	7.00
	MISCELLANEOUS	
2837	Button—Bronze button for Home-Radio recording double push button assembly—Package of 2	.50
3265	Switch—Compartment lamp switch with mounting nut and escutcheon	1.40
3266	Bracket—Compartment lamp socket bracket—Package of 5	.50

Order By Stock Number Only

REPLACEMENT PARTS—Continued

Stock No.	DESCRIPTION	List Price
3267	Bushing—Bakelite screw bushing for lamp socket—Package of 10	$0.50
3268	Gear—48 tooth micarta intermediate gear for control switch	1.25
3269	Gear—73 tooth micarta drive gear for control switch	1.25
3270	Cap—Friction cap for end of drive shaft on drive motor—Package of 10	.60
3271	Ring — Retaining ring for control switch motor—2 used—Package of 8	.50
3272	Screw Assembly—Comprising screw nut and spacer—For Home-Radio recording double push button assembly—Package of 10	.65
3273	Bracket—Lamp socket and bracket—For Home-Radio signal ruby crystal	.55
3274	Crystal—Ruby crystal and mounting—For Home-Radio recording signal—Package of 5	2.50
3275	Resistor—17 ohms—Wire wound resistor—Package of 5	3.75
3276	Receptacle—Male input power supply receptacle	1.10
3277	Microphone unit suspension spring—Package of 10	1.50
7197	Shade—Compartment lamp shade—Package of 5	1.75
7312	Transformer—Input transformer	6.55
7376	Home-Radio recording double push button assembly—Complete	1.50
7377	Body—Home-Radio recording double push button body—Package of 5	.50
7378	Contact base—Home-Radio recording double push button base	.85
7379	Cable—Red and Black 16″ Cable—From terminal strip to terminal strip on S.P.U.	.65
7380	Cable—6″ red shielded cable—From control switch to record volume control—Package of 5	1.90
7381	Cable—6″ black shielded cable—From control switch to record volume control—Package of 5	1.90
7382	Cable — 46″ black shielded cable — From pickup terminal board to control switch—25-30 cycles	.55
7383	Cover Assembly—Microphone front cover assembly	8.45
7384	Frame—Microphone frame less cover assemblies	19.25
7385	Mechanism—Microphone mechanism unit	60.00
7386	Cord—Microphone cord	3.60
7387	Tone compensating reactor with bracket	.85
7396	Cover—Control switch cover	1.00
7397	Cable—56″ black shielded cable—From pickup terminal board to control switch	.55
7399	Cable—Power cable with 3 way polarity plug—From record changer to control switch and S.P.U.	2.00
7411	Cover Assembly — Microphone back cover assembly	7.25
8784	Cable—Compartment lamp cable	$0.75
8785	Cable—Main cable—From S.P.U. to input transformer, control switch, tapped resistor and receiver	3.40
8786	Switch—Control switch complete—Comprising switch, Intermediate gear and drive motor—For remote control only	49.55
8787	Motor—Drive motor complete with drive shaft—For control switch	16.00
8788	Reactor and capacitor pack—One assembly in metal container	4.10
8789	Filter unit in metal container	4.30
8792	Microphone	75.00
8793	Cable—Main cable—From S.P.U. to input transformer, control switch, tapped resistor and receiver—25-30 cycles	2.75
10270	Cord—Outside power cord with male and female connector plugs	2.00
10371	Socket—Compartment lamp socket	1.40
	DRIVING UNIT ASSEMBLIES	
2837	Button—Bronze colored push button—Package of 2	.50
2844	Terminal strip—Complete with 6 terminals, mounting screws, spacers and nuts	1.20
2845	Blade—Spring blade—Restores motor to normal position when power is off—Complete with micarta mounting blocks, washers and mounting screws	.50
2846	Gear—Micarta bendix gear, pinion and taper pin	1.00
2847	Relay Assembly — Complete with mounting screws	5.00
2848	Blade—Switch blade complete with clamping plate and mounting screws	.60
2850	Plunger — Oxidized finish — Brass plunger—Package of 2	.50
2851	Gear—Micarta bendix gear, pinion and taper pin—Volume control drive gear	1.00
2852	Gear — Micarta intermediate drive gear, pinion and taper pin—For volume control	1.00
2853	Gear — Star gear and taper pin — Located on end of condenser shaft and fits into ring	1.00
2854	Contact—Contact screw and lock nut—Located on contact plate No. 7158—Package of 5	.50
2855	Switch Assembly—Plunger switch—Comprising micarta strip with 6 contact blades and 2 mounting screws	1.20
2856	Spring—Tension spring assembly for plunger—Complete with mounting screws—Package of 5	.50
2857	Plug—Male section of 3 prong polarity plug	.70
3008	Contacts — Remote relay contact spring blades—Package of 4 sets	.50
7157	Gear—Ring gear with taper pin—Located on end of cam shaft	2.00

Order By Stock Number Only

REPLACEMENT PARTS—Continued

Stock No.	DESCRIPTION	List Price
7158	Plate—Contact plate complete with 6 contacts, lock washers and mounting screws	$1.50
7159	Cable—Braided cable—From driving unit to terminal board located in cabinet	2.00
7160	Cable—Braided cable and male section of polarity plug—From driving unit to power supply	2.00
7162	Switch—Auxiliary switch assembly—Comprising micarta strip with four contacts and one common plate—Located on control panel	1.50
7163	Escutcheon — Auxiliary switch escutcheon—Complete with mounting screws, nuts and spacers	2.00
7398	Rheostat—Volume control rheostat with bracket and gear—Assembled	3.00
8616	Motor—Drive motor complete with two pinion gears	16.00
8617	Capacitor Pack—In metal container	11.00
8797	Mechanism—Driving mechanism complete	80.00
	CONTROL BOX ASSEMBLIES	
2833	Button—Red colored push button—Package of 2	.50
2834	Button—Red colored push button with white insert—Package of 2	.50
2835	Button—Black colored push button—Package of 2	.50
2836	Button—Black colored push button with white insert—Package of 2	.50
2837	Button—Bronze colored push button—Package of 2	.50
2838	Bullseye — Pilot lamp indicator — Package of 2	1.30
2839	Switch Assembly—Dilecto strip with 10 contacts—Inside of control box—Package of 5	9.20
2840	Socket—Miniature base pilot lamp socket with mounting bracket, mounting screws, washers and nuts	.50
2842	Cover—Control box metal cover with mounting screws, rubber bushings, button guide plate and stud	5.00
2843	Base Assembly—Control box base—Comprising base, felt and clamping plate	$1.40
3283	Log strip assembly—Comprising 3 paper log strips and one metal holder	.50
7154	Cable—Flat type—25 foot long—Complete with terminals	10.00
7161	Terminal board—Comprising micarta strip with 12 terminals, 12 screws, 1 rubber grominet and mounting bracket	2.00
7254	Cable—Flat type—50 foot long—Complete with terminals	20.00
8798	Control box—Complete less cable	12.00
8799	Control box—Complete with 25 foot cable	22.00
	CABINET ASSEMBLY	
X-1	Control panel	15.00
X-2	Control Panel—25-30 cycles	7.50
X-3	Foot	10.50
X-4	Escutcheon—Tuning dial escutcheon	2.90
X-5	Doors—Top compartment doors—R.H. and L.H. less hinges—1 pair	124.75
X-6	Doors—Bottom grille doors—R.H. and L.H. less hinges—1 pair	72.35
X-7	Carving—Top front post top carving	4.15
X-8	Carving — Top front post bottom carving	3.10
X-9	Carving — Bottom front post top carving	7.55
X-10	Carving — Bottom front post bottom carving	6.10
X-11	Carving—Inside arch rail carving	4.45
3136	Screen—Tuning dial screen—Package of 2	.50
3156	Label—Metal trade mark label—Package of 5	2.50
7279	Support—Dial screen support	.50
9395	Cabinet — Cabinet complete less equipment	580.00
9396	Cabinet — Cabinet complete less equipment—25 cycles	580.00
10254	Hinge—Cabinet door hinge with mounting screws—Package of 4	1.70

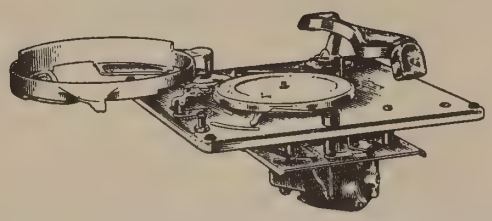
Order By Stock Number Only

S. O. 7964 5M 6-3-'31

RCA Victor

Automatic Record Changing Mechanism

SERVICE NOTES



RCA Victor Automatic Record Changing Mechanism

[First Edition—20M
Copyright, November, 1931]

SERVICE DIVISION

RCA Victor Company, Inc.
Camden, N.J.
A RADIO CORPORATION OF AMERICA SUBSIDIARY

REPRESENTATIVES IN PRINCIPAL CITIES

CONTENTS

Installation 3
Speed Variations 5
Adjustment of Magazine Roller 5
Failure of Needle to lower properly 6
Failure of Needle to lower onto record surface 6
Needle fails to clear record after playing 6
Failure of record to deposit on turntable 7
Records discharge improperly from turntable 7
Failure to trip on eccentric groove 8
Inability to set for manual operation 8
Failure to stop 8
Continued tripping of mechanism 8
Clutch slipping 8
Retiming the mechanism 9
Removing the motor board 9

ILLUSTRATIONS

Schematic diagram 3
Adjusting height of tone arm 4
Adjusting elevator pad 4
Adjustment of damper pads 5
Adjusting position of tone arm 6
Adjusting tone arm locating screw 6
Adjusting tone arm cable tension screw 7
Adjusting spindle height 7
Magazine adjustments 7
Record transfer lever adjustment 7
Method of checking transfer lever lateral adjustment 8
Adjusting height of elevator shaft 8
Timing position 9
Motor parts 10
Bottom view of mechansim 10
Top view of mechanism showing parts 11
Top view of mechanism with plate removed 11

Property of RCA Victor Company, Inc. Confidential and to be used only by its Authorized Distributors and Dealers in furnishing service in connection with its apparatus

SERVICE NOTES

for

RCA Victor Automatic Record Changing Mechanism

The RCA Victor Automatic Record Changing Mechanism is used in RCA Victor Models RAE-26, RAE-59 and RAE-79. Except for the finish of exposed parts, these units are identical. This mechanism is of simple, fool-proof design and will perform efficiently with a minimum of service requirements. Features of this mechanism are; continuous playing of one side of ten 10-inch records, operation at either 33⅓ or 78 R.P.M. for playing standard or Program Transcription records manually or automatically, a special clutch to prevent jamming in case of failure of a part and a heavy duty motor operating at synchronous speed thereby eliminating any need for regulating devices. A general view of the mechanism is shown on the cover page. Figure 1 shows the schematic wiring diagram.

The Replacement Parts for this mechanism are listed in the Service Notes on each individual instrument. The identification nomenclature given on pages 10 and 11, will be found useful in identifying parts. Where parts are identical in all models the Stock Number of each part is given in addition to its name.

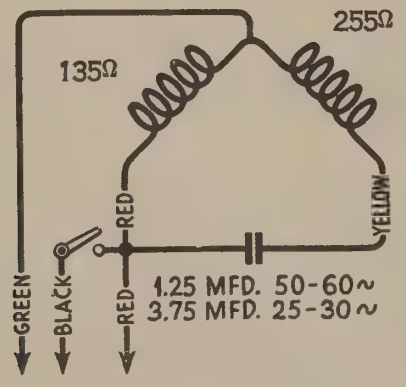


Figure 1—Schematic Diagram

INSTALLATION

After unpacking the instruments in which this mechanism is used, it is imperative that certain preliminary checks be made before they are placed in operation. These checks should be performed in the order given and any adjustments found necessary must be made.

1. When installing the instrument it is advisable to see that all parts are properly lubricated without excessive grease or oil on any parts. This is especially important in the speed reducing unit. A lack of oil in the spindle bearings or between the sprocket and the surface upon which it rests, may be the cause of a "wow" at slow speed. Also excessive grease on the gears or on the damper pads may cause this same condition. The motor should be lubricated with light oil once every six months. Oil holes are provided at each end of the motor. Once a year the turntable and speed reducing unit should be removed and all exposed gears thoroughly cleaned and lubricated with light grease. All bearings should be lubricated with oil. Be careful not to lose the spiral spring in the end of the spindle or the washers under the turntable and speed reducing unit.

2. The motor board must be level. This should be checked both ways by means of a small spirit level. Placing the cabinet legs on the same surface will usually insure the motor board being level.

3. A small spring is located in the center of the turntable spindle. Be sure that this is in position before placing the turntable on the spindle. After placing the turntable on the spindle make sure that the spindle nose may be easily depressed. If it is not, then remove the turntable and turn the spring upside down or replace it with a new spring.

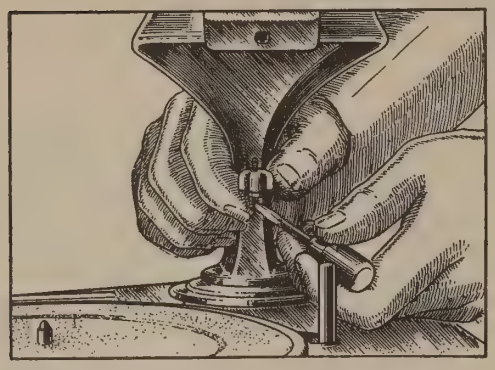


Figure 2—Adjusting height of tone arm

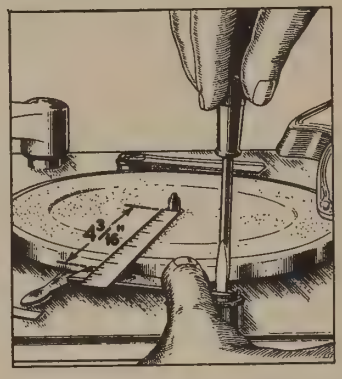


Figure 3—Adjusting elevator pad

4. Examine the wire cable that is attached to the back of the tone arm. It should be seated on the small pulleys over which it passes.

5. Place a Home Recording needle into the pickup as far as it will go. Then lower the pickup on the side of the turntable. The needle should extend from 1/32" to 1/16" below the top of the metal edge of the turntable. If it does not, an adjustment can be made by means of a screw located under the tone arm. Lifting the arm provides accessibility to the screw. See Figure 2.

6. If when starting the automatic mechanism, the needle lowers onto the smooth outer rim of the record but fails to swing into the first groove, it may be caused by the following:

   (a) Cabinet not level. Check as indicated in Paragraph 1.

   (b) Weak tension in spring. A flat spring presses against the tone arm lever on the under side of the motor board. See Figure 17 Page 11. Bending it so as to increase its tension against the tone arm lever will cause the needle to swing into the first record groove. Be careful not to bend it too much as excessive tension will cause the needle to skip several grooves.

7. After the instrument has completed one record changing operation, a ten inch record should extend about three-quarters way over each elevator pad. If this condition does not exist, an adjustment can be made by means of the screws that hold the pads in position. A pair of pliers heavily padded with cloth or other soft material should be used to hold the elevator shafts while loosening and tightening the screws. The distance from the closest part of either pad to the edge of the spindle is approximately 4 3/16". Figure 3 shows the method of making this adjustment.

If any adjustments are necessary other than the foregoing, a reference to the Service Date section of this booklet should be made.

Remember That the Control Lever Can Be Changed from Automatic to Manual Only When the Mechanism is Not Changing Records

SERVICE DATA

The following Service information will be found useful in making any adjustments or correction of any irregular operation that may be necessary. All the major adjustments are accessible from the rear of the cabinet. For the sake of clearness the illustrations in this text do not show the cabinet background.

No special tools are required other than a small offset screw driver. (Stock No. 2930) A stand consisting of three Stock No. 7203 will be found useful in supporting the mechanism should removal from the cabinet be required.

(1) SPEED VARIATIONS (WOW)

A variation in the speed of the turntable evidenced by distortion on long sustained notes when playing Program Transcription records may be caused by any of the following:

(a) Improper operation. It is very important when changing the speed shift lever from 78 R.P.M. operation to 33⅓ R.P.M. operation, to place the hand on the turntable and hold it until it is positively engaged by the driving mechanism.

Figure 4—Adjustment of damper pads

(b) Lack of proper lubrication. It is important that excessive grease on the gear reducing mechanism be avoided and that sufficient oil is present between the ratchet and the surface upon which it rests. Also clean and oil the spindle bearing and wipe off any excess lubricant that may be on the damper pads or the drive gear upon which it rests.

(c) Improper Adjustment of the Damper Pads. The damping pads with the necessary springs are provided to place a load on the 33⅓ R.P.M. driving gear at all times while it is in operation. Placing such a load on the gear takes up any possible play and reduces the possibility of a "wow" during operation at the slower speed.
Adjust these pads by slipping each spring to one side and bend them until they are 1/16" beyond the opposite surface upon which they rest. (See Figure 4).

(d) Washers Not in Place. A metal washer is placed directly under the speed reducing mechanism and a leather washer directly over it, both washers being over the spindle. These washers must be in their proper position. Also if the leather washer has become hard it must be replaced.

(e) In some cases, removing the speed reducing mechanism and turning it approximately 90° and then replacing it, may eliminate a "wow" caused by improper meshing of the gears.

(2) ADJUSTMENT OF MAGAZINE ROLLER

The magazine roller should be set in such a position that the plane of the roller is 90° to a line drawn from the center of the magazine bearing to the center of the roller. The height should be adjusted so that it will just touch the magazine when it is empty.

(3) FAILURE OF NEEDLE TO LOWER PROPERLY

Failure of the needle to lower onto the smooth outer rim of the 10-inch records when the instrument is playing automatically may be caused by:

(a) Improper Tone Arm Setting. Loosen the set screws as shown in Figure 5. With the mechanism out of its cycle, press the locating lever at a point near the flat spring until the lever strikes the stop screw. Holding the locating lever, Figure 17, in this position, move the front portion of the trip lever, Figure 15, until the pin against which the flat spring presses, is making contact with the locating lever. Holding the two levers in this position, move the pickup arm until the needle is 1/16" from the first groove of a standard 10-inch record. Now retighten the two set screws shown in Figure 5.

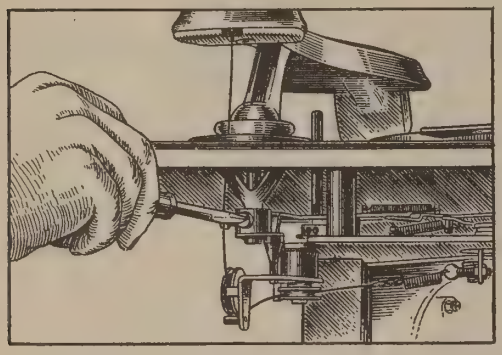


Figure 5—Adjusting position of tone arm

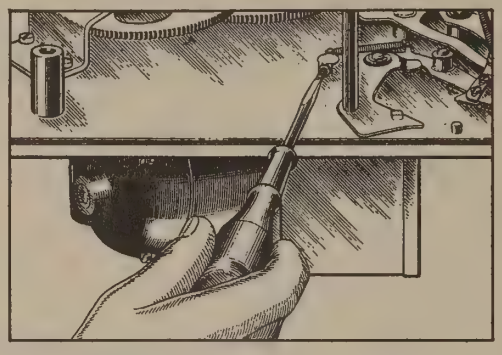


Figure 6—Adjusting tone arm locating screw

(b) Improper adjustment of tone arm locating screw. This adjustment, shown in Figure 6, can be used to make a substitute adjustment for that described in (a), when the mechanism is out of the cabinet. Make the adjustment so that the needle will lower exactly 1/16" from the first groove on a standard 10-inch record. Loosen the lock nut on the adjusting screw by means of a No. 4 Spintite wrench on which the shoulder has been ground sufficiently thin for clearance. *Do not attempt to make this adjustment without first loosening the lock nut.* Tighten the lock nut when the proper adjustment has been made.

(4) FAILURE OF NEEDLE TO LOWER ONTO RECORD SURFACE

Failure of the needle to lower onto the record surface may be caused by:

(a) Cable out of pulley. Examine the tone arm cable and ascertain that it is seated in the pulley.

(b) Shielded pickup wire improperly placed. Examine the shielded lead coming out of the tone arm base and make sure that it is free from the moving parts of the mechanism.

(c) Incorrect setting of tone arm lowering screw. Check the position of the tone arm as described in Paragraph 5, Page 4.

(d) Turntable washer not in place. A leather washer is supplied to fit under the turntable. If this part is not in place, the turntable will be too low, and may cause the needle not to lower onto the record.

(e) Incorrect adjustment of cable tension screw. The cable tension screw shown in Figure 7 should be so adjusted that the needle will lower smoothly onto the record without dropping. When this adjustment is obtained, the cable will be slightly loose when the needle is lowered onto a record. Loosen the lock nuts, turn the screw to the right or left as required and retighten the lock nut. Check the adjustment to make sure that the needle clears the record on the return of the tone arm. The needle should rise 1/16" from the record before any horizontal motion takes place.

(5) NEEDLE FAILS TO CLEAR RECORD AFTER PLAYING

Failure of the needle to clear the record surface on the return of the tone arm is caused by too loose adjustment of the cable tension. Adjust this tension as described in Section 4, Paragraph (e).

(6) FAILURE OF RECORD TO DEPOSIT ON TURNTABLE

Incorrect lowering of the record onto the turntable may be caused by.

(a) Improper turntable spindle height. The height of the turntable spindle nose should be approximately 1/32" above the inside bottom surface of the record magazine. Adjustment of this height made by means of the screw at the bottom of the motor. (See Figure 8).

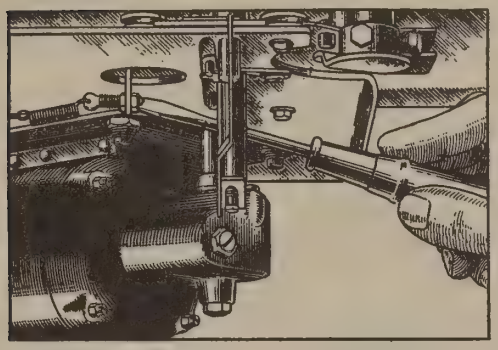


Figure 7—Adjusting tone arm cable tension screw

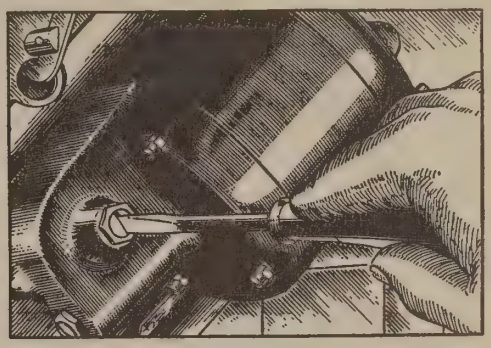


Figure 8—Adjusting spindle height

(b) Improper setting of magazine. The horizontal swing of the magazine should be so adjusted when the mechanism is out of cycle that the outer surface at its nearest point to the nearest side of the turntable spindle is 5 1/32". This can be done by loosening the two screws as shown in Figure 9, moving the magazine to its correct position and retightening the screws.

(c) Improper height of record transfer lever. The small plate on top of the motor board at the left side of the turntable should be so adjusted that it will depress approximately 1/32" when the magazine swings over the turntable. When this adjustment is made correctly, the transfer lever will engage the bottom record in the magazine as the latter is swinging back into the playing position. A small adjusting screw and lock nut are provided for this adjustment. See Figure 10.

(d) Improper Position of Record Transfer Lever. When a ten-inch record is placed so that its edge touches both pins on the record transfer lever, a line drawn from the center of the hole of the lever to the center of the record hole should pass directly over the center of the spindle. See Figure 11. The two record transfer lever mounting screws can be loosened and the lever shifted until this condition exists. Also when a record is on the turntable it should just clear this lever. Unless this adjustment is properly made the record may not center properly over the spindle.

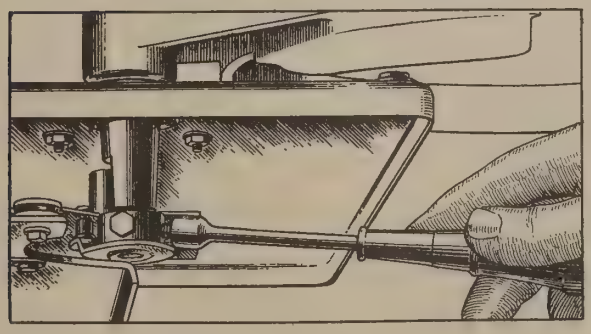


Figure 9—Magazine adjustments

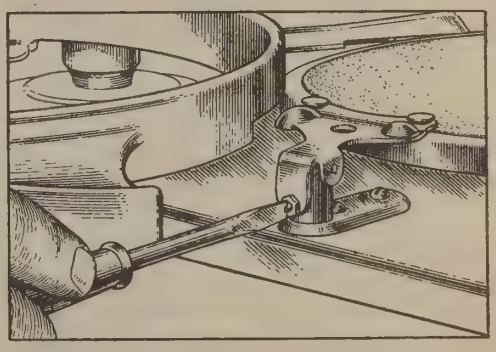


Figure 10—Record transfer lever adjustment

(e) Weak spring in turntable spindle. The spring inside the turntable spindle which holds up the spindle nose will cause the records to align improperly with the turntable spindle if the spring tension is too weak or if the spindle nose is sticking inside the spindle. Access to the spring for stretching the coils or for replacement can be obtained by removing the turntable.

(7) RECORDS DISCHARGED IMPROPERLY FROM TURNTABLE

Failure of the Record on the turntable to be removed and placed in the magazine can be caused by:

(a) Improper horizontal adjustment of elevator pads. The elevator pads Figure 16, should be so adjusted that the inside of the pad flange is 4 3/16" from the nearest side of the turntable spindle. See Figure 3. Loosen the screw on top of the elevator shaft, move the pad to its correct position, holding both the pad and the elevator shaft in position and tighten the screw. Care should be observed that the ridge in the elevator shaft is not turned against the slot in the elevator shaft actuating lever so as to cut the latter. Grip the shaft with padded pliers while this adjustment is being made in order to prevent the shaft from turning. If for any reason the elevator pads have been removed, always place the one with the rubber surface toward the front of the mechanism when replacements are being made.

(b) Improper adjustment of elevator shaft. The elevator shafts should rise to such a height as to give 1/16" clearance between the lowest surface of the elevator pad bottom and the top of the empty magazine. This adjustment can be made by means of the screw and lock nut as shown in Figure 12.

(8) FAILURE TO TRIP ON ECCENTRIC GROOVE

Failure of the mechanism to change records when the eccentric groove is reached may be caused by:

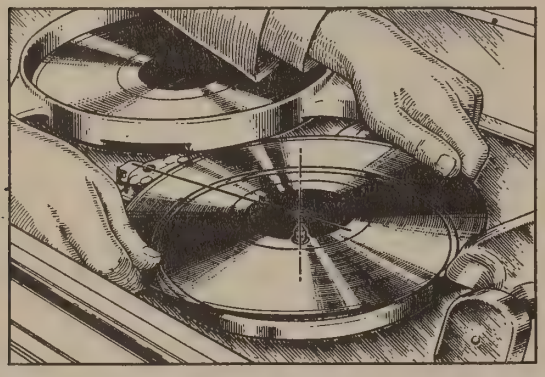


Figure 11—Method of checking transfer lever lateral adjustment

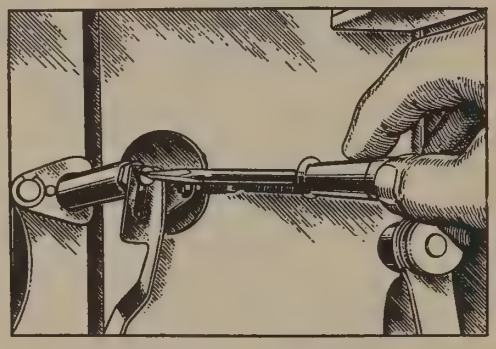


Figure 12—Adjusting height of elevator shaft

(a) Improper setting of the latch plate. Adjust the latch plate, Figure 17, by means of a small offset screw driver such as Stock No. 2930, until it makes proper contact with the latch trip when the eccentric groove is reached.

(b) Weak spring on trip lever. A weak spring on the latch trip lever will be a cause of failure to trip.

(9) INABILITY TO SET FOR MANUAL OPERATION

The manual operation lever should set in its back position so as to free the tone arm and prevent the mechanism from tripping. *This change from automatic to manual operation should be made only when the mechanism is out of its cycle, otherwise the mechanism will reject continuously.* The back position of the lever should be such that the end of the lever causes the latch trip to clear the latch plate by 1/32". An incorrect setting of the latch plate may cause the trip lever to clear the plate at one position of the tone arm, but to make contact with the plate at some other position of the tone arm. Check this point when adjusting the latch plate.

(10) FAILURE TO STOP

Failure of the mechanism to stop after the "off" button has been pressed, and the mechanism has completed its cycle is caused by improper setting of the secondary stop switch. See Figure 17. The switch body should be so mounted that the contacts will open 1/32" when the cycle is completed, but will close as soon as the mechanism has tripped.

(11) CONTINUED TRIPPING OF MECHANISM

This condition may be caused by:

(a) Manual operation lever set for non-automatic operation during cycle.

(b) Improper setting of latch plate.

(c) Improper timing of gears and associated parts. See Section 13 for the correct method of retiming.

(12) CLUTCH SLIPPING

Slipping of the clutch when the mechanism is passing through the cycle causing a loud clicking noise, may be caused by:

(a) Weak spring on pawl carrier. Remove the pawl spring Figure 17, and increase its tension by removing two or three coils.

(b) Turntable spindle shaft too low. This condition will cause binding between the pawl carrier and the clutch wheel. Raise the spindle as shown in Figure 8.

(c) Binding in any of the moving parts. Such binding may be in the slide, the magazine, the elevator shaft or the gears. The slide rollers at the left are mounted on eccentric shafts for adjustment of play. These may be so regulated as to cause excessive binding of the slide. Examine all of these parts carefully, and take any necessary steps to relieve the binding.

(13) RETIMING THE MECHANISM

Should it be necessary to retime the mechanism after replacing parts, or because of continued tripping proceed in the following manner:

(a) Allow the mechanism to operate until the slide Figure 17 is in its extreme forwarding position. When this setting is reached the straight side of the cam, Figure 17, will be parallel with the side of the slide.

Check the position of the trip lever and roller at this time to see that they are approximately as shown in Figure 13. If the various parts are not in their proper relation, the mechanism should be retimed.

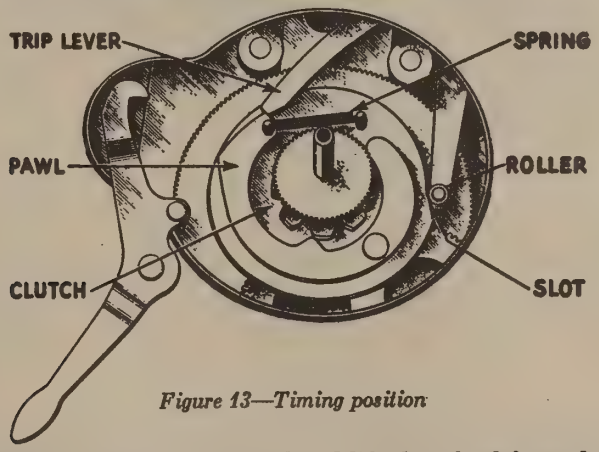


Figure 13—Timing position

(b) Loosen the set screw in the clutch wheel and lift the wheel from the turntable spindle.

(c) Lift the pawl carrier until it disengages from the gear.

(d) Lower the pawl carrier into mesh with the gears so that the trip lever is touching the end of the pawl as shown in Figure 13, when the cable lever roller is engaged in the slot on the side of the pawl carrier as shown.

(e) Recheck to see that the straight side of the cam is parallel with the slide.

(f) Replace the clutch wheel and retighten the set screw, making sure that the set screw fits into the spot on the turntable spindle.

(14) REMOVING MOTOR BOARD

Should it be necessary to remove the motor board from the mechanism for replacement of any of the parts, the following procedure should be used:

(a) Remove nuts and washers from the bolts which hold the motor board to the cabinet, and disconnect the pickup leads and power wiring to the mechanism. Then lift the mechanism from the cabinet.

(b) Loosen the two set screws and remove the magazine lever Figure 9.

(c) Lift out magazine.

(d) Unhook tone arm cable from spring.

(e) Loosen the two set screws in the tone arm lever.

(f) Remove the three small screws in the tone arm base, taking care not to lose the lock nuts.

(g) Disengage the tone arm lever from the tone arm shaft and carefully lift the tone arm from the motor board, bringing the tone arm lever and the shielded cable up through the tone arm base hole in the motor board.

(h) Remove the screw and lock nuts in the bottom of the elevator shaft.

(i) Lift elevator shaft from mechanism.

(j) Unfasten wires from motor board.

(k) Remove the four motor board screws which support the bottom plate.

(l) Carefully lift the motor board from the mechanism.

Access can now be had to all the parts on the bottom plate. The parts can be assembled in the reverse order from that given above. It will then be necessary to make various adjustments after the parts have been reassembled.

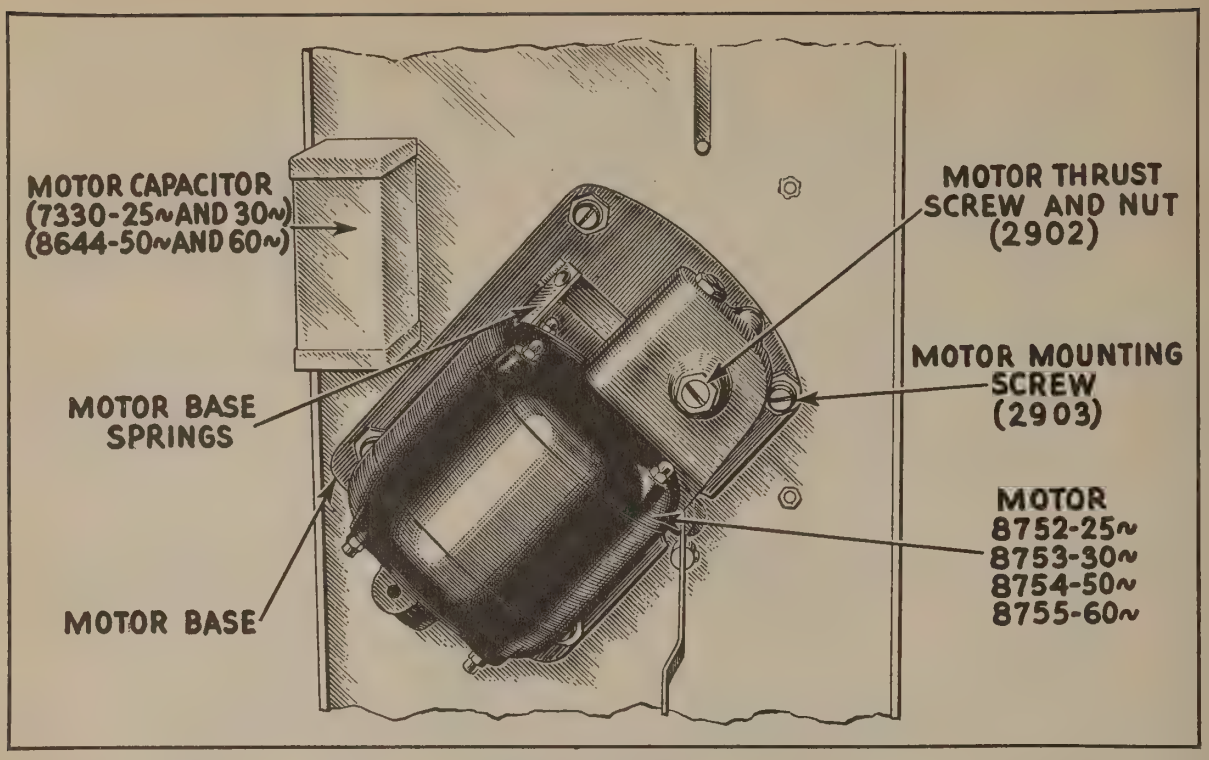


Figure 14—Motor parts

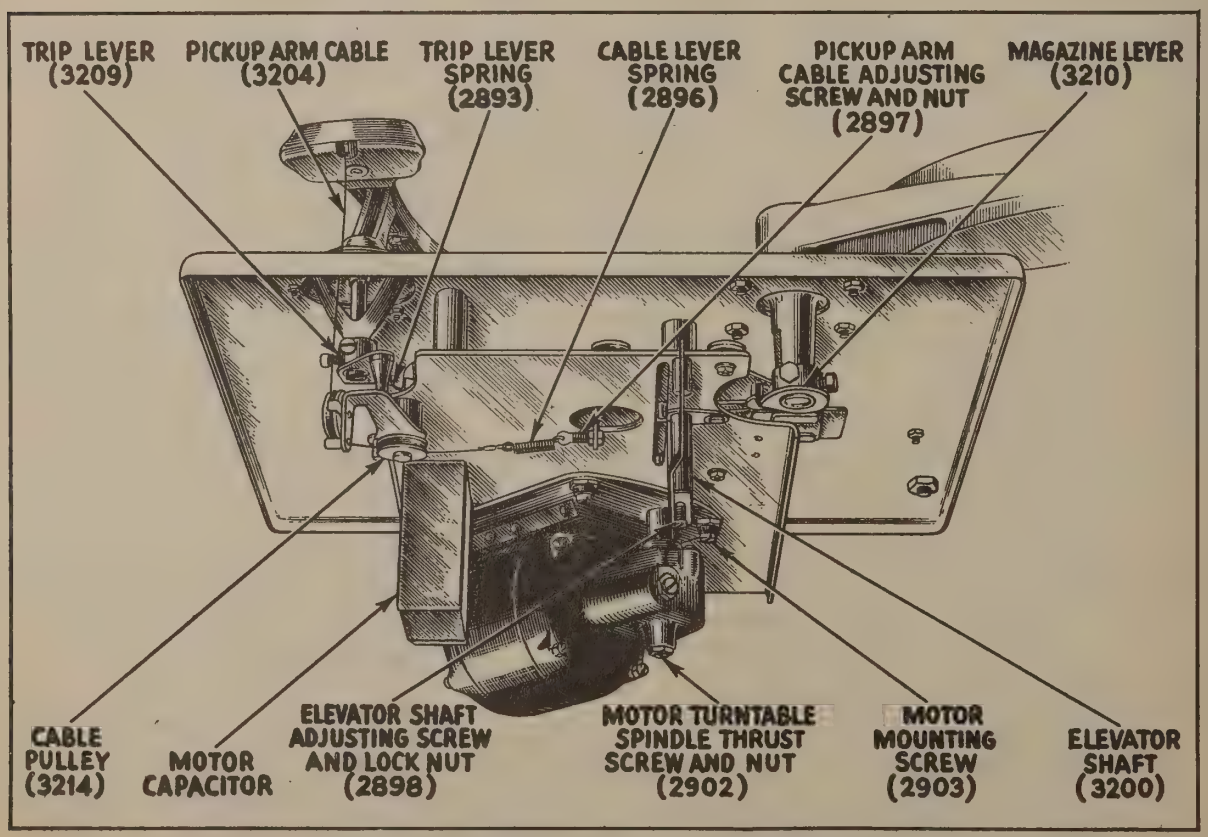


Figure 15—Bottom view of mechanism showing parts

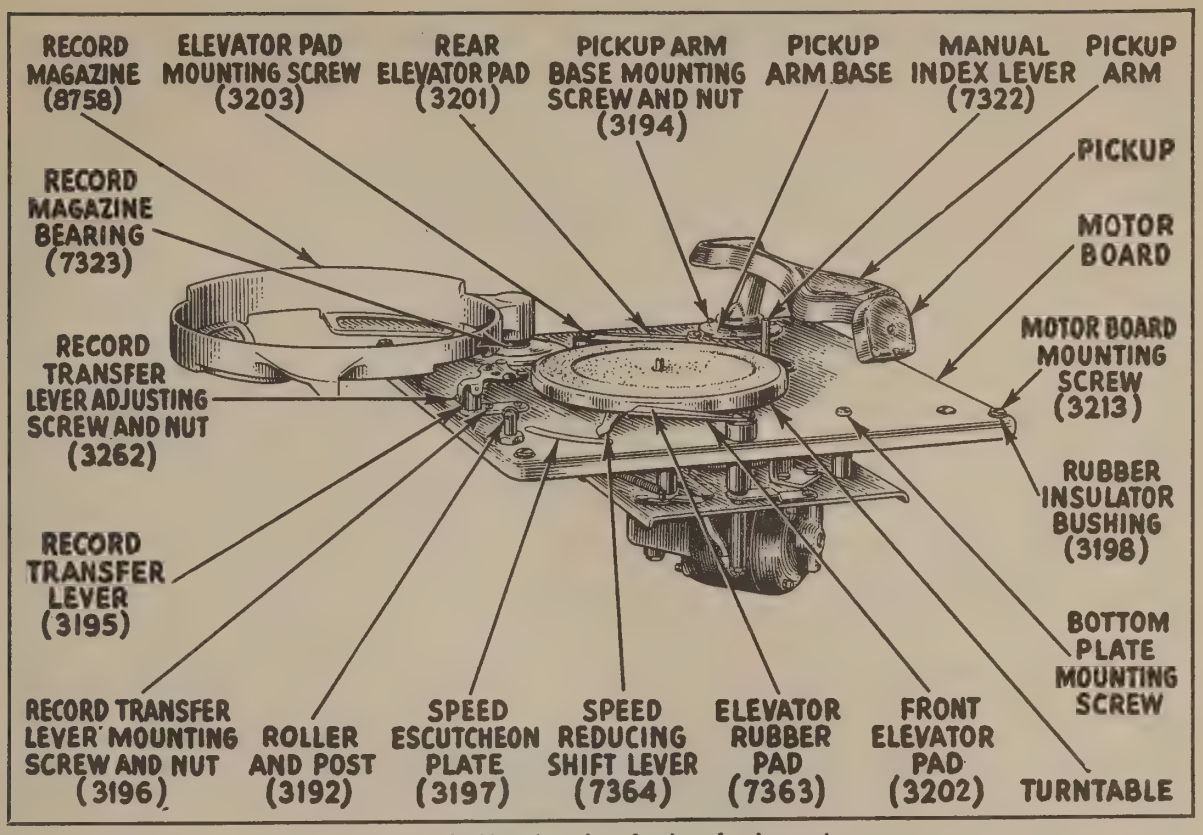

RECORD MAGAZINE (8758)
ELEVATOR PAD MOUNTING SCREW (3203)
REAR ELEVATOR PAD (3201)
PICKUP ARM BASE MOUNTING SCREW AND NUT (3194)
PICKUP ARM BASE
MANUAL INDEX LEVER (7322)
PICKUP ARM
PICKUP
MOTOR BOARD
MOTOR BOARD MOUNTING SCREW (3213)
RUBBER INSULATOR BUSHING (3198)
BOTTOM PLATE MOUNTING SCREW
TURNTABLE
FRONT ELEVATOR PAD (3202)
ELEVATOR RUBBER PAD (7363)
SPEED REDUCING SHIFT LEVER (7364)
SPEED ESCUTCHEON PLATE (3197)
ROLLER AND POST (3192)
RECORD TRANSFER LEVER MOUNTING SCREW AND NUT (3196)
RECORD TRANSFER LEVER (3195)
RECORD TRANSFER LEVER ADJUSTING SCREW AND NUT (3262)
RECORD MAGAZINE BEARING (7323)

Figure 16—Top view of mechanism showing parts

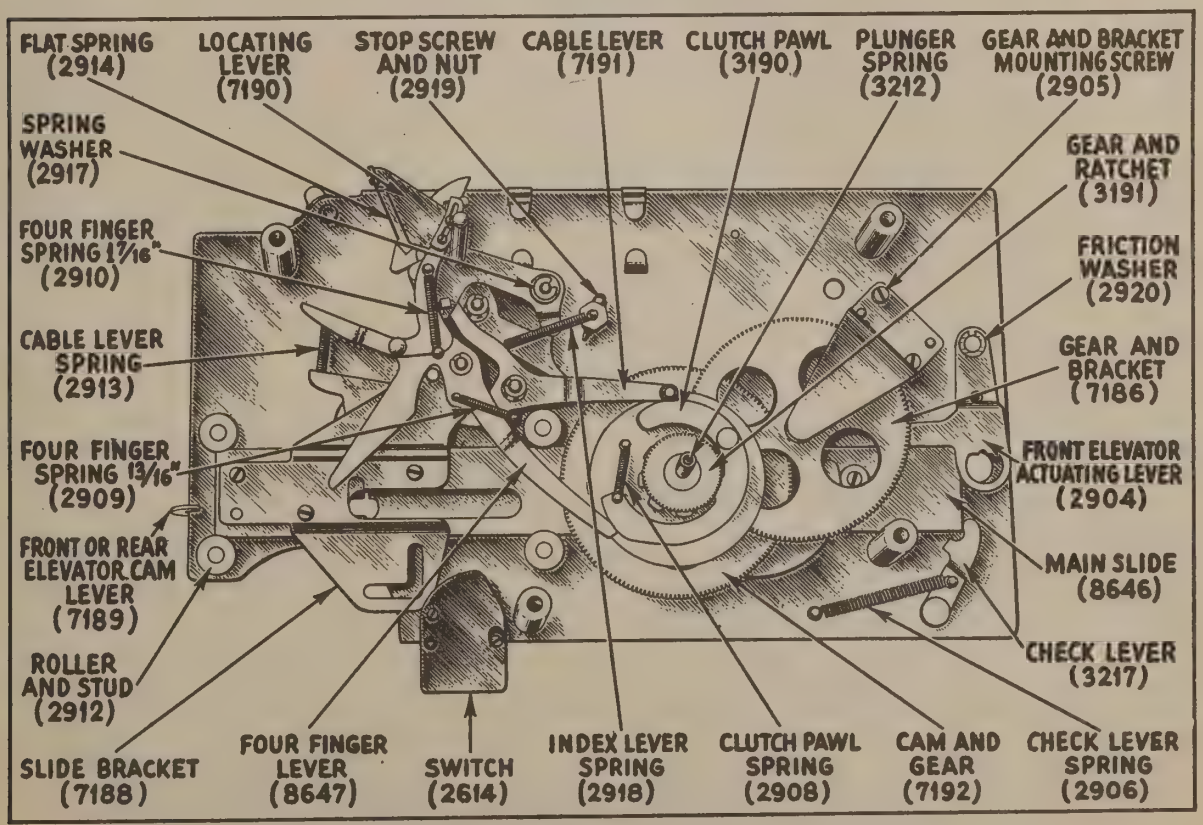


Figure 17—Top view of mechanism with plate removed

S. O. 8463

RCA Victor

Special Service Information

SERVICE DIVISION

RCA Victor Company, Inc.
Camden, N.J.
A RADIO CORPORATION OF AMERICA SUBSIDIARY

REPRESENTATIVES IN PRINCIPAL CITIES

RCA Victor Service Information

Prepared By
RCA Victor Service Division

The following information will be found useful when doing service work with various types of RCA Victor receivers, Victor Radio instruments and RCA Radiolas. In most cases the diagrams are self explanatory.

MAGNETIC PICKUP CONNECTIONS

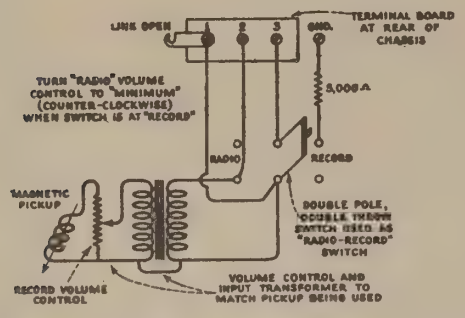

LINK OPEN
TERMINAL BOARD AT REAR OF CHASSIS
GND.
TURN "RADIO" VOLUME CONTROL TO "MINIMUM" (COUNTER-CLOCKWISE) WHEN SWITCH IS AT "RECORD"
5,000 Ω
RADIO
RECORD
MAGNETIC PICKUP
DOUBLE POLE, DOUBLE THROW SWITCH USED AS "RADIO-RECORD" SWITCH
RECORD VOLUME CONTROL
VOLUME CONTROL AND INPUT TRANSFORMER TO MATCH PICKUP BEING USED

Figure 1—Connections to RCA Victor Models R-7, R-7A, R-7 D.C., R-7 L.W., R-9 and R-9 D.C.

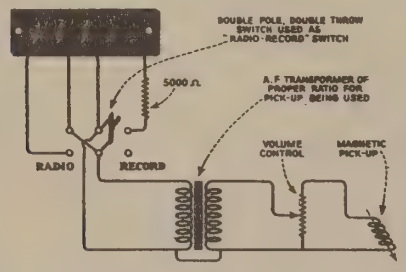


Figure 2—Connections to RCA Radiola 80 (with tone control) and RCA Radiola 82

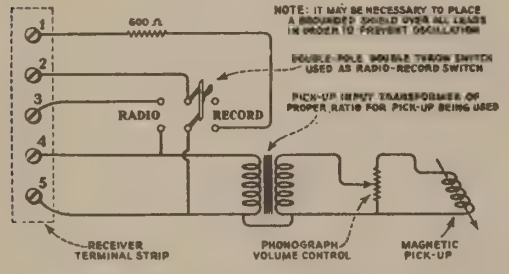

NOTE: IT MAY BE NECESSARY TO PLACE A GROUNDED SHIELD OVER ALL LEADS IN ORDER TO PREVENT OSCILLATION
600 Ω
DOUBLE-POLE DOUBLE-THROW SWITCH USED AS RADIO-RECORD SWITCH
PICK-UP INPUT TRANSFORMER OF PROPER RATIO FOR PICK-UP BEING USED
RADIO
RECORD
RECEIVER TERMINAL STRIP
PHONOGRAPH VOLUME CONTROL
MAGNETIC PICK-UP

Figure 3—Connections to RCA Radiolas 42 and 48 and to Victor Radio R-14 and R-15

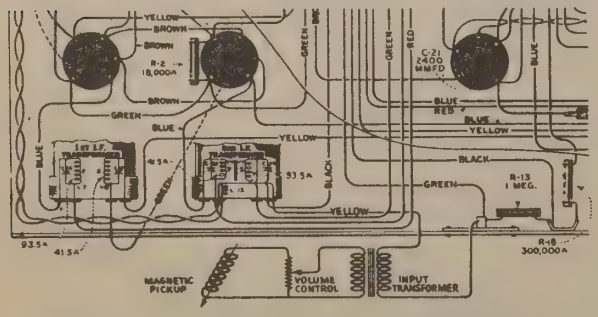


Figure 4—Connections to RCA Victor Model R-10

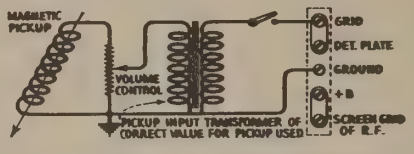


Figure 5—Connections to Victor Radio R-35 and R-39

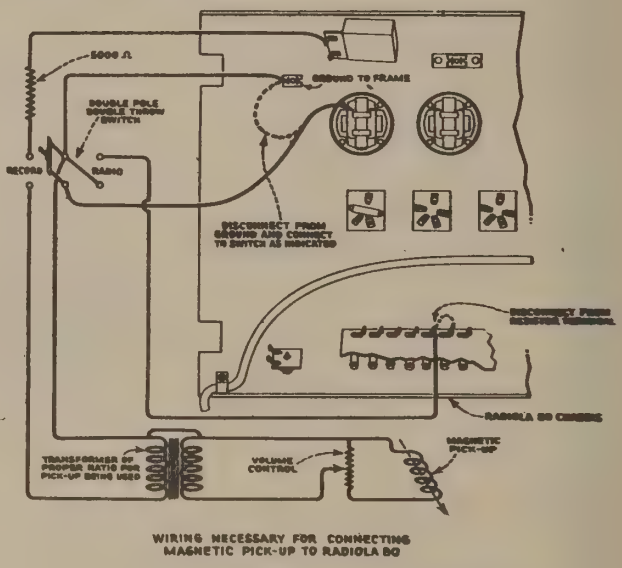

5000 Ω
GROUND TO FRAME
DOUBLE POLE DOUBLE THROW SWITCH
RECORD
RADIO
DISCONNECT FROM GROUND AND CONNECT TO SWITCH AS INDICATED
RADIOLA 80 CHASSIS
TRANSFORMER OF PROPER RATIO FOR PICK-UP BEING USED
VOLUME CONTROL
MAGNETIC PICK-UP
WIRING NECESSARY FOR CONNECTING MAGNETIC PICK-UP TO RADIOLA 80

Figure 6—Connections to RCA Radiola 80 (without tone control)

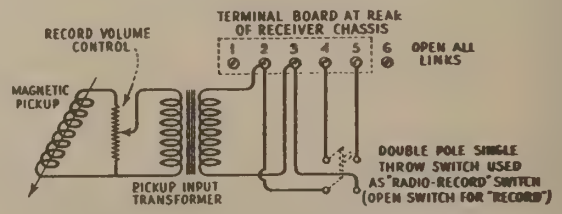

TERMINAL BOARD AT REAR OF RECEIVER CHASSIS
1 2 3 4 5 6
OPEN ALL LINKS
RECORD VOLUME CONTROL
MAGNETIC PICKUP
PICKUP INPUT TRANSFORMER
DOUBLE POLE SINGLE THROW SWITCH USED AS "RADIO-RECORD" SWITCH (OPEN SWITCH FOR "RECORD")

Figure 7—Connections to RCA Victor Model R-11

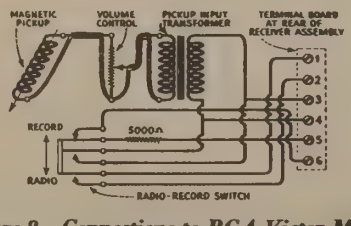


Figure 8—Connections to RCA Victor Models R-50 and R-55

LOUDSPEAKER CONNECTIONS

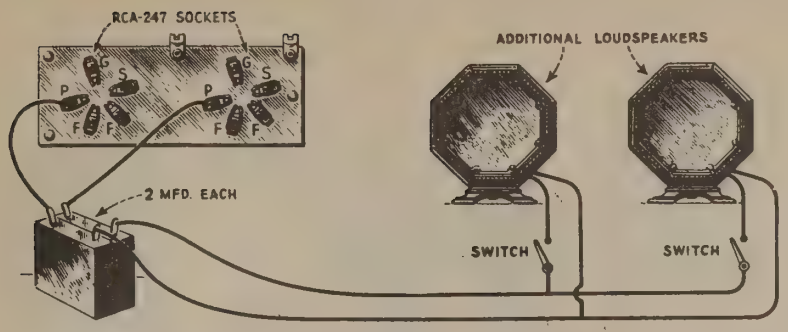


Figure 9—Connections for attaching additional loudspeakers to models using Pentodes in push-pull as the output amplifier

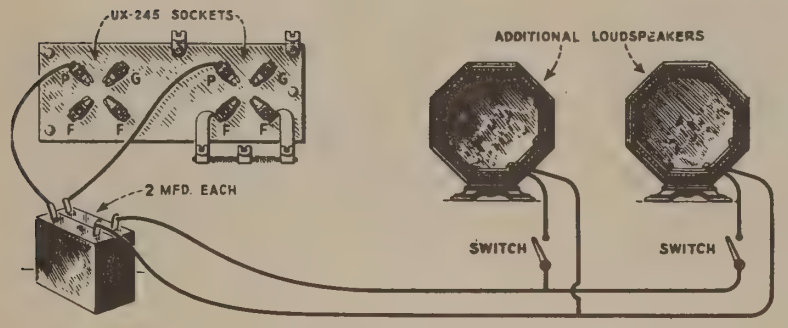


Figure 10—Connections for attaching additional loudspeakers to models using three-element tubes in push-pull for the output amplifier

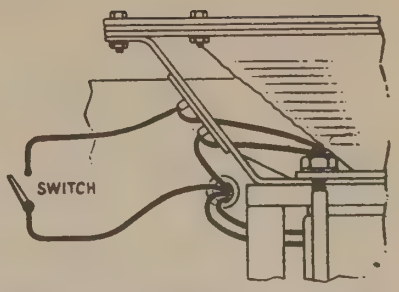


Figure 11—Method of connecting switch for disconnecting set speaker while using external speakers

CONNECTING ADDITIONAL SPEAKERS TO MODELS USING SINGLE OUTPUT STAGE

In order to connect additional loudspeakers to models using a single output stage, the following variation must be made from the connections shown in Figures 9 and 10.

Connect the loudspeakers, the switches and one capacitor in the same manner as shown in Figures 9 and 10. The other capacitor (shown connected to the other plate) should be connected to the low side (+ B side) of the primary of the output transformer. As this connection varies with different receivers a circuit diagram of the receiver in question must be examined in order that the proper point can be located. If this is not feasible, connecting this capacitor to the chassis frame will usually give the desired results.

HEADPHONE CONNECTIONS

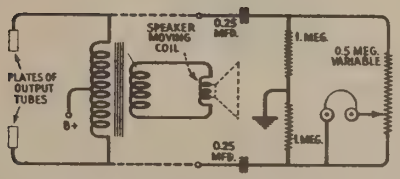


Figure 12—Connections to push-pull output stages when it is desired to vary volume without affecting radio output

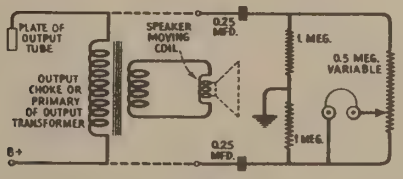


Figure 13—Connections to single output stages when it is desired to vary volume without affecting radio output

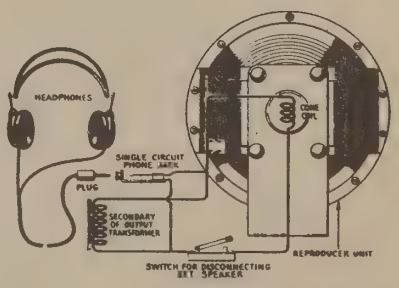


Figure 14—Connections to any receiver using dynamic type speaker. The volume can be varied only by the receiver volume control

RCA VICTOR SHORT WAVE ADAPTOR CONNECTIONS

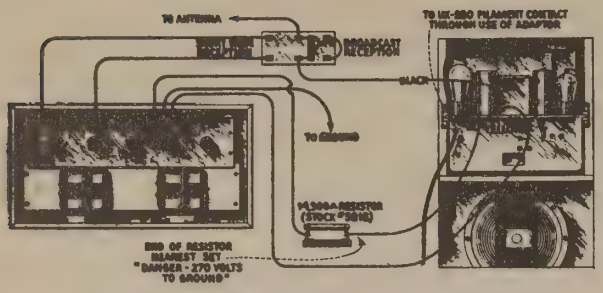

TO ANTENNA
BROADCAST RECEPTION
TO UX-280 FILAMENT CONTACT THROUGH USE OF ADAPTOR
BLACK
TO GROUND
END OF RESISTOR NEAREST SET "DANGER - 270 VOLTS TO GROUND"

Figure 15—Connections to RCA Victor Model R-10

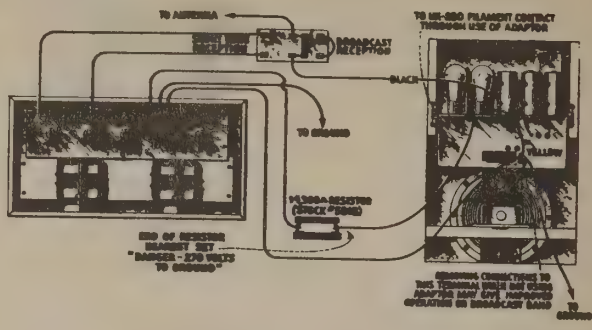


Figure 17—Connections to RCA Victor Models R-11, RE-18 and RAE-26

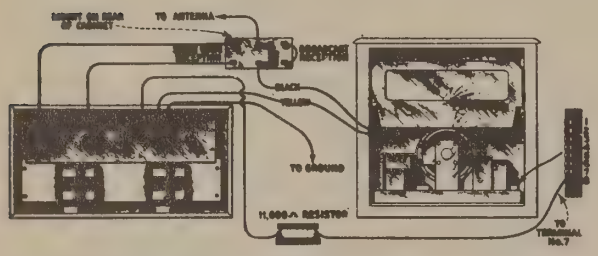


Figure 16—Connections to RCA Victor Models R-50, R-55, RAE-59 and RAE-79 (connect to amplifier No. 1 (Top) in Model RAE-79)

CONNECTIONS TO RCA RADIOLA 64

Connect terminal No. 1 of the adaptor to the antenna and terminal No. 2 to the antenna binding post of Radiola 64. Terminal No. 4 of the adaptor goes to terminal No. 10 on the Radiola 64 S. P. U. Terminal No. 5 of the adaptor goes to terminal No. 9 on the S. P. U. *Do not make any connections between this last mentioned terminal and ground.*

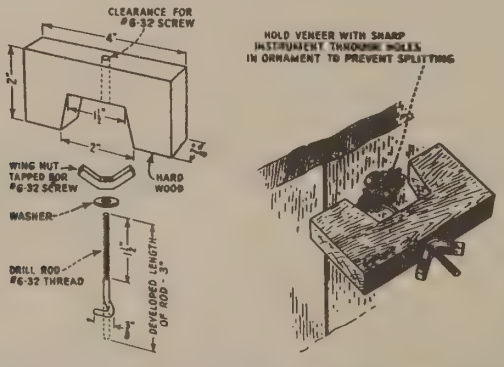


Figure 18—Details of special tool for removing door pulls on various Victor, Radiola and RCA Victor Models

RCA